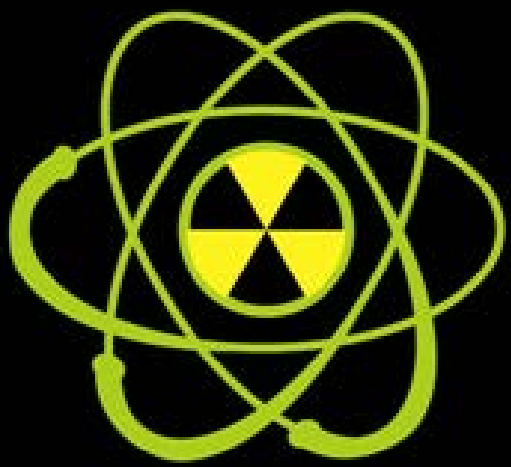
2018

After-Action Report/Improvement Plan
July 25, 2018



EXERCISE OVERVIEW

Exercise Name	2018 RITN Tabletop Exercise (TTX)
Exercise Date	July 25, 2018
Scope	This exercise is a distance-based tabletop exercise planned for 2 ½ hours. Exercise play is limited to RITN facilities and their response partners' collective challenges and considerations for improved and effective response.
Mission Area(s)	Response
Capabilities	Public Health & Medical Services
Objectives	**Objective 1:** RITN hospital staff is able to identify staffing strategies and plans to ensure adequate staffing during a surge caused by a distant radiological event. **Objective 2:** RITN hospital staff is able to describe their approaches for triaging patients and determining initial treatment actions for patients with Acute Radiation Syndrome (ARS). **Objective 3:** RITN hospital staff is able to discuss their procedures for the use of medical countermeasures and other pharmaceuticals in high demand.
Scenario	Medical surge from a distant radiological incident
Sponsor	Radiation Injury Treatment Network® (RITN) National Marrow Donor Program (NMDP) Office of Naval Research (ONR)
Participating Organizations	Allegheny Health Network – Pittsburgh, PA Barbara Ann Karmanos Cancer Center – Detroit, MI Barnes-Jewish Hospital – St. Louis, MO Dana Farber Cancer Institute – Boston, MA Mount Sinai Hospital – New York, NY North Shore University Hospital – Manhasset, NY Roger Williams Medical Center – Providence, RI Rush University Medical Center – Chicago, IL Scripps Green Hospital – San Diego, CA Stanford Hospital and Clinics – Palo Alto, CA University of California Davis Hospital – Davis, CA University of Chicago Medicine – Chicago, IL University of Miami – Miami, FL University of Wisconsin Health – Madison, WI
Point of Contact	RITN Control Cell RITN@NMDP.ORG (612) 884-8276

EXERCISE SUMMARY

On July 25, 2018, RITN centers and the RITN Control Cell participated in a tabletop exercise to discuss RITN centers planning actions to identify staffing strategies and plans to ensure adequate staffing during a surge, describe their approaches for triaging patients and determining initial treatment actions for patients with ARS, and discuss their procedures for the use of medical countermeasures and other pharmaceuticals in high demand following a distant radiological event. 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:

Exercise Scenario Ground Truth

- A 10-kiloton Improvised Nuclear Device (IND) was detonated in a major metropolitan area.
- The blast occurred at least 500 miles away from your facility and there is no concern of fallout affecting your location.
- RITN Control Cell staff begins to monitor the situation and start sending out daily Situation Reports (SitReps).
- All centers are requested to submit daily Healthcare Standard (HCS) capabilities matrix.

Day 4

- The National Disaster Medical System (NDMS) issues activation protocol for your region and the local Federal Coordinating Center (FCC) establishes a Patient Reception Area (PRA) and expects patients to start arriving in the next 24-48 hours.

Day 5

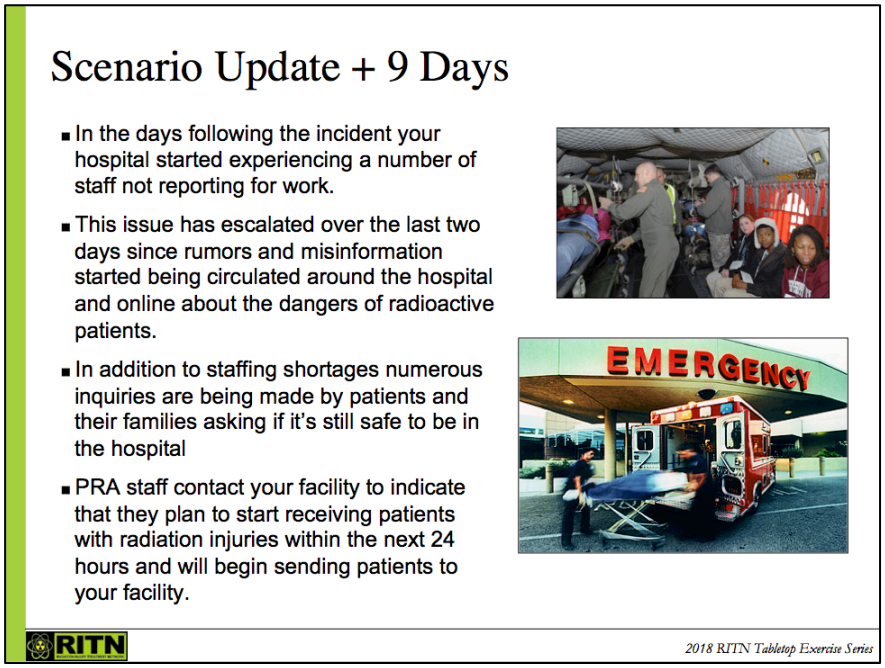
- The first NDMS aircraft begin to arrive at the PRA carrying patients with traumatic injuries. These patients are sent to NDMS hospitals in the area, but your facility has not received any patients at this time.

ANALYSIS OF CAPABILITIES

Module 1: Messaging and Staffing

Participants were provided the following update to the scenario information (Figure 1). Based

Figure 1: Scenario Update Event + 9 Days



on the scenario inject information, RITN Centers were asked to discuss multiple considerations related to their staff to include messaging. Considerations for messaging included current plans to keep staff safe and the type and method of communication used to inform staff.

Steps to Ensure Staff Safety: RITN centers would activate their hospital incident command/management teams as the immediate action to ensure staff safety. Once the command team has assembled, radiation safety information would be compiled by the Radiation Safety Officer and disseminated to staff via email and staff huddles, especially in the emergency department. Just-in-time training content would be developed by the Radiation Safety Officer, the hospital PIO, along with other medical specialists with an emphasis on employee safety as well as message consistency. One RITN center indicated that senior leadership would accompany radiation safety personnel during hospital rounds to reinforce safety messages as well as answer questions. Situational awareness updates would also occur during department/unit/staff meetings as a reminder of procedures to ensure a safe work environment. Information would be disseminated via memos, blast emails from hospital leadership, town hall meetings, social media, and staff information sessions.

Staff Messages: Participating centers stated that reinforcing work safety is the main message communicated to staff. Employees, their families and the patients would be educated on the facts of radiation and the assurance the hospital is a safe work environment, the measures taken to continue a safe work environment, assurances that staff would not become contaminated, and the patients coming are exposed and not contaminated (i.e. the differences between exposure and contamination). The incident management team in collaboration with the Radiation Safety Officer, the RITN Medical Director, RITN Coordinator, and the Communications Department would draft and approve the messages.

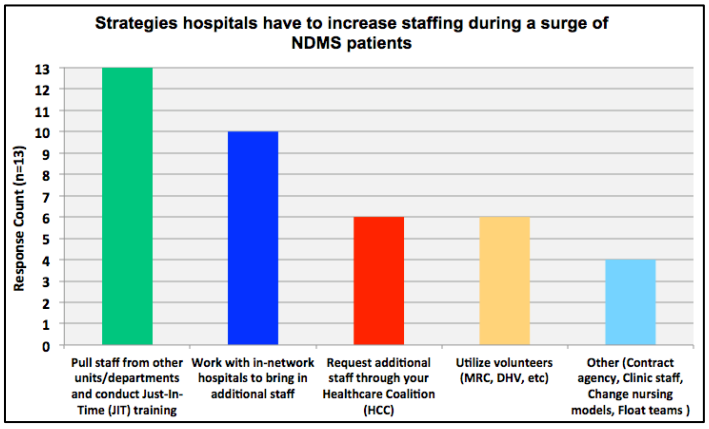
Specific messages would be developed and distributed for both internal and external audiences. External messages would be coordinated through the PIO Office/Communications Office with local health department as well as city, county, state, and the VA. Dissemination platforms would include all social media channels, facility webpage, and traditional media outlets (television and radio). Examples of internal message dissemination provided were:

- Internal notification and email
- Dedicated webpage accessed via RITN center website with FAQs and "mythbusters"
- RITN center newsletter
- Hospital paging and text messages
- Hospital intranet
- Paper-based FAQs
- Town Hall meetings (and daily briefings)
- Recorded messages sent through internal phone tree

Staff Increases: RITN centers discussed multiple strategies to increase staffing levels during a NDMS surge of patients (Figure 2). All participating centers utilized a variety of strategies:

- Pull staff from other units/departments and conduct just-in-time training
- Reassign staff from in-network hospitals
- Request staffing support from surrounding health systems as needed.
- Utilize volunteers

Figure 2: Strategies to Increase



Though nine of the 13 participating centers have a process in place to request a waiver so staff/patient ratios can be adjusted, the participating RITN centers indicated no difficulty in reassigning staff internally to support a NDMS surge of patients. Given the staffing depth, staffing support resources through their internal systems and networks or neighboring hospitals, and the number of days prior to the arrival of NDMS patients, RITN centers demonstrated the capability to quickly identify staff for reassignment to support a surge of NDMS patients.

RITN Radiation Safety Course: Eight of the 13 participating RITN centers have a predefined course for non-medical staff for radiation training. The Radiation Safety Officer is primarily responsible for developing the content for non-medical staff and this content is included in new hire training, annual in-person or online refresher radiation safety training to include Environmental Services (and Housekeeping) staff. One participating RITN center utilizes the radiation training courses provided by the RITN to augment their course developed by the RSO. All participating RITN centers stated their existing courses are easily tailored/customized by job action/function or department prior to a surge of NDMS patients.

Volunteers: Given the events in this scenario, 8 of the 13 participating RITN centers indicated use of volunteers for this event as described in the scenario; all participating RITN centers have a process in place to credential volunteers if needed. RITN centers provided a variety of processes to ensure credentials are appropriate, such as:

- Internal departments verify credentialing (Volunteer Services and Emergency Management)
- Department of Health
- Healthcare Coalition for request and credentialing

All RITN centers indicated a type of supervision policy for non-medical volunteers or partner/shadow policy. Participating RITN centers utilizing volunteers for this event stated medical volunteers would be partnered with in-house medical staff with input from the in-house staff on suitability to provide care.

Strengths

The following strengths were demonstrated:

Strength 1: All RITN centers demonstrated that ability to rapidly disseminate a coordinated internal and external message upon notification of the receipt of NDMS patients.

Strength 2: All RITN centers demonstrated and discussed the ability to rapidly augment staffing levels to treat a surge of NDMS patients. Participating centers also stated current plans

to augment staff include community partners and use of hiring agencies for non-medical and medical staff support.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: The Radiation Safety Officer should ensure that all medical and non-medical staff completes a predefined radiation safety course. If a predefined radiation safety course is not available, the RSO should work with RITN to identify and complete said course.

Module 2: Patient Triage and Medical Countermeasures

Participants were provided the following update to the scenario information (Figures 3 and 4).

Figure 3: Scenario Update Event + 10 Days

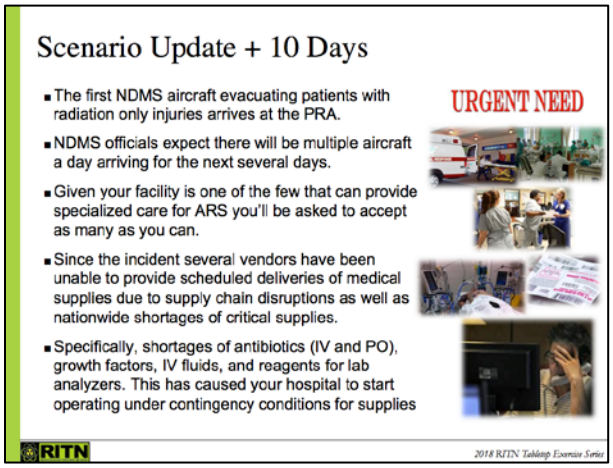
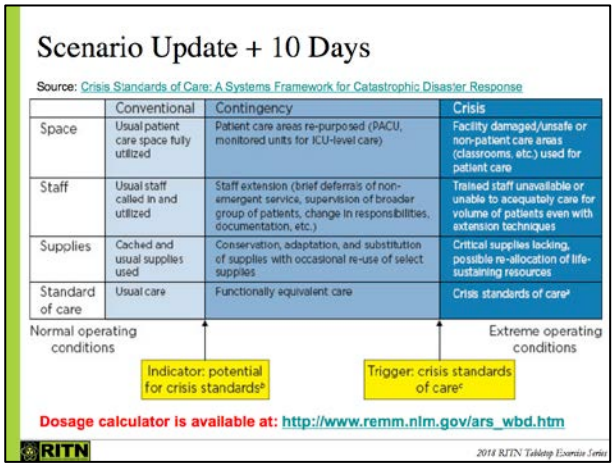


Figure 4: Scenario Update Event + 10 Days



Based on the scenario inject information, 10 days have elapsed since the detonation and RITN centers are experiencing disruptions to their supply chains and resources as there are nationwide shortages of critical supplies (e.g. IV and PO, growth factors, IV fluids, and reagents for lab analyzers). RITN centers are being asked to accept as many ARS patients as possible.

Patient Reception Area: All but two of the participating RITN centers have a formal plan that outlines the process to designate a location to receive patients from the Patient Reception Area where they will be re-triaged and processed for care. Two of the participating RITN centers would triage received NDMS patients in Hematology/Oncology Clinic or their BMT Unit and 1 participating RITN center would receive NDMS patients through the Radiation Oncology ambulance entrance where they would be scanned by the Radiation Control Team prior to entering the hospital. The remaining RITN centers would receive and triage these patients at a reception area near their emergency department or in their emergency department. Three of the 13 participating RITN centers stated their process to receive patients from the PRA differs for ambulatory patients that do not have immediate life threatening issues while 10 of the 13 participating RITN centers conduct the screening and triage within their emergency department.

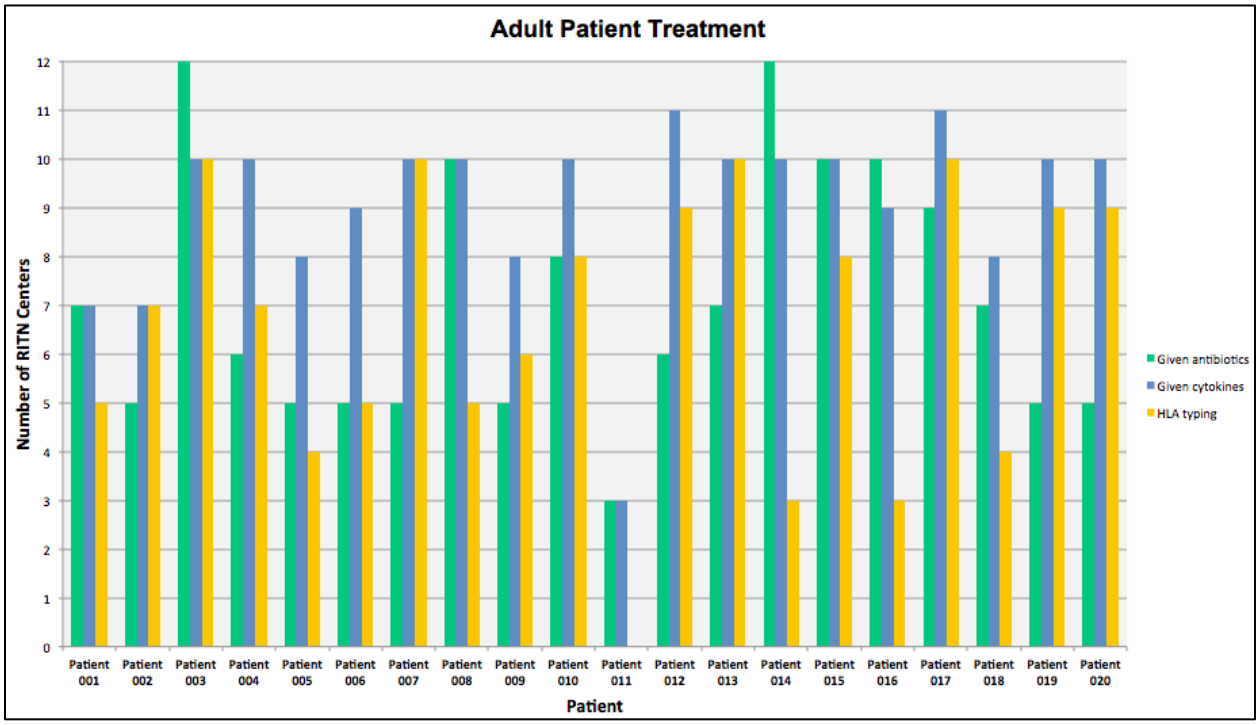
Adult Patient Treatment: Eleven of 12 participating RITN centers chose the adult patients to triage and treat. Of note, none of the patients had received growth factors prior to arrival at the RITN center (See Appendix B). The participating RITN centers did not reach consensus on the triage of any of the adult patients.

All participating RITN centers triaging and treating the adult patients would provide at a minimum the following information to the patients discharged for outpatient care:

- Signs and symptoms to observe (i.e. the standard outpatient BMT information with emphasis on exposure and injuries from radiation)
- Treatment plan
- Contact information for the RITN center
- Schedule for follow-up visits and information on clinic location
- Information on local resources
- Housing information and how to coordinate placement
- Transportation resources for follow-up visits

The following graph displays the number of adult patients that would receive cytokines, antibiotic therapy, and HLA typing. RITN centers reached consensus on the following:

Figure 5: Adult Treatment Therapies



- Patient 3 given antibiotics
- Patient 14 given antibiotics

Pediatric Patient Treatment: One participating RITN center discussed the pediatric patients for triage and subsequent medical management (see Appendix B). Of note, none of the patients had

received growth factors prior to arrival at the RITN center. Triage and medical management decisions are as follows:

- Nine (9) of the 20 patients would be admitted to the bone marrow transplant unit because of their exposures and comorbidities.
- None of the pediatric patients would be admitted to hematology/oncology beds
- Five (5) of the pediatric patients were treated as outpatients because their exposures were very low and none of the pediatric patients would be discharged and sent home
- Five (5) of the pediatric patients were designated for palliative care management only and would be re-assessed once in the palliative care for intensive treatment.
- Two (2) of the pediatric patients would be discharged home.
- None of the pediatric patients were designated for palliative care management only.
- Four (4) of the pediatric patients were not provided a triage decision.
- None of the pediatric patients would receive antibiotics and/or cytokines.
- Nine (9) of the pediatric patients would be given HLA typing.

The RITN center triaging and discharging the pediatric patients for outpatient care would be provided with a monitor plan and follow-up schedule. No other information was discussed/provided regarding the information provided to the discharged pediatric patients.

Strengths

The following strengths were demonstrated:

Strength 1: Each participating RITN center demonstrated capability to medically manage admit of an additional patient following receipt of the initial wave of patients including the immediate provision of medical and mental/behavioral consultations necessary based on the patient's need.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: RITN centers triaging and treating pediatric patients should review (and update if necessary) the information that would be provided to NDMS pediatric patients and their families if discharged for outpatient care. If a content update is necessary, consideration should be given to include BMT information, a comprehensive contact list for the RITN center in the event symptoms develop/worsen, housing information, and transportation information.

Area for Improvement 2: All RITN centers should develop a formal plan for the transport of ARS patients from their Patient Reception Area. Staff safety precautions and recommendations should be included in this plan and the Radiation Safety Officer should participate in the plan's development.

Area for Improvement 3: All RITN centers should develop (or review and update) policies or procedures regarding the reuse and sterilization of otherwise disposable equipment for circumstances of critical shortages. Considerations for planning include: stockpiling disposable equipment needed for NDMS patients and re-supply agreements from neighboring facilities for equipment needed for NDMS patients only.

Area for Improvement 4: All participating RITN centers should develop and or augment their existing just-in-time training for HLA typing and medical countermeasures pertaining to the receipt of victims that were exposed to radiological material. This training should be developed as part of improvement planning following this exercise.

CONCLUSION

This report augments existing planning/training/exercising programs related to RITN center receipt and medical management of radiologically exposed patients transported to their center and their capabilities to provide medical care in austere situations in which crisis standards of care have been implemented. The strengths validate well-established aspects of the plans while the opportunities for improvement provide information to enhance, refine, or improve existing plans, protocols, policies, procedures, and systems. It is anticipated that the improvement plan will be incorporated into the efforts of each participating RITN center 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.

APPENDIX A: IMPROVEMENT PLAN

This improvement plan template has been developed specifically for the RITN centers participating in the 2018 RITN Tabletop Exercise conducted on July 25, 2018. RITN centers 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.

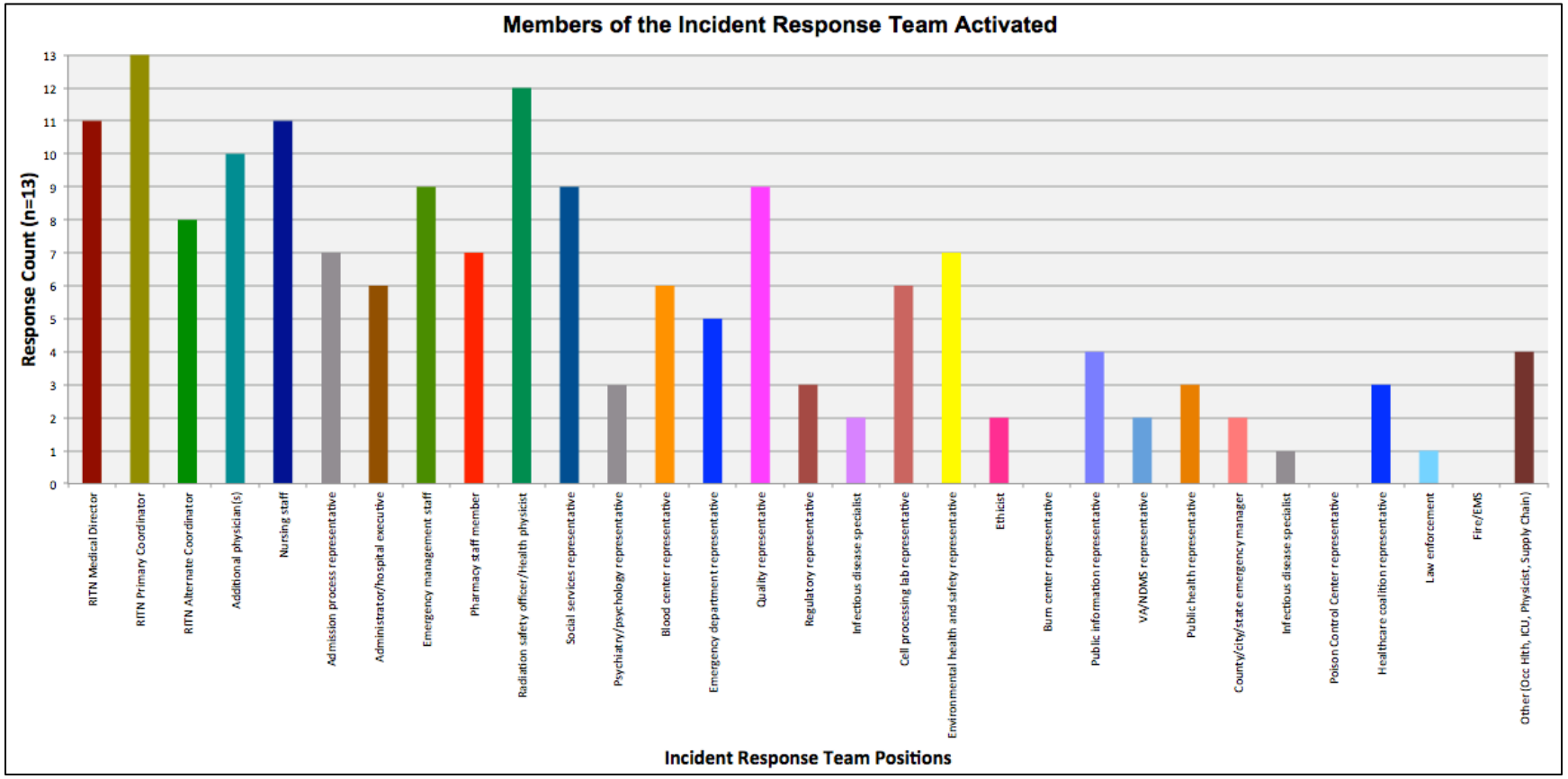
APPENDIX B: PATIENT DECISIONS & INCIDENT MANAGEMENT TEAM ACTIVATION

The following tables depict the adult and/or pediatric patient medical management decisions.

Adult Patient Triage						
	Admitted to BMT bed	Admitted to hematology/oncology bed?	Treated as an outpatient	Discharged to home / shelter	Provided palliative care only	Total
Patient 001	1	1	10	0	0	12
Patient 002	1	2	9	0	0	12
Patient 003	6	6	0	0	0	12
Patient 004	1	1	10	0	0	12
Patient 005	1	9	1	0	1	12
Patient 006	1	2	9	0	0	12
Patient 007	7	3	2	0	0	12
Patient 008	4	6	1	0	1	12
Patient 009	3	2	7	0	0	12
Patient 010	7	2	1	1	0	11
Patient 011	1	2	7	1	1	12
Patient 012	5	6	0	0	1	12
Patient 013	9	0	1	0	2	12
Patient 014	3	7	2	0	0	12
Patient 015	7	3	1	1	0	12
Patient 016	1	8	2	0	1	12
Patient 017	10	1	0	0	1	12
Patient 018	4	4	2	0	2	12
Patient 019	2	4	6	0	0	12
Patient 020	4	7	1	0	0	12

Pediatric Patient Triage						
	Admitted to BMT bed	Admitted to hematology/oncology bed?	Treated as an outpatient	Discharged to home / shelter	Provided palliative care only	Total
Patient 021	0	0	1	0	0	1
Patient 022	1	0	0	0	0	1
Patient 023	1	0	0	0	0	1
Patient 024	0	0	No Decision	0	0	1
Patient 025	0	0	No Decision	0	0	1
Patient 026	0	0	No Decision	0	0	1
Patient 027	0	0	No Decision	0	0	1
Patient 028	1	0	0	0	0	1
Patient 029	1	0	0	0	0	1
Patient 030	1	0	0	0	0	1
Patient 031	0	0	1	0	0	1
Patient 032	0	0	1	0	0	1
Patient 033	1	0	0	0	0	1
Patient 034	0	0	1	0	0	1
Patient 035	0	0	0	1	0	1
Patient 036	0	0	1	0	0	1
Patient 037	0	0	0	1	0	1
Patient 038	1	0	0	0	0	1
Patient 039	1	0	0	0	0	1
Patient 040	1	0	0	0	0	1

Members of the Incident Response Team Activated for the Exercise



APPENDIX C: EXERCISE PARTICIPANTS

Participating Organizations	
Allegheny Health Network	Lori Stover
Allegheny Health Network	Mary Ann Raible
Allegheny Health Network	Dawn Wentley
Allegheny Health Network	Keri Rodella
Allegheny Health Network	John Lister
Allegheny Health Network	Patricia Reiser
Allegheny Health Network	C.L. Briedenbaugh
Allegheny Health Network	Jennifer Onda
Allegheny Health Network	Kari Smith
Allegheny Health Network	Salman Fazel
Barbara Ann Karmanos Cancer Center	Brenda Kramer
Barbara Ann Karmanos Cancer Center	Fred Valero
Barbara Ann Karmanos Cancer Center	Laura Zubeck
Barbara Ann Karmanos Cancer Center	Megan Seneraz
Barbara Ann Karmanos Cancer Center	Scott McCarter
Barbara Ann Karmanos Cancer Center	Michael Joiner
Barbara Ann Karmanos Cancer Center	Joe Rakowski
Barbara Ann Karmanos Cancer Center	Jim Martin
Barbara Ann Karmanos Cancer Center	Clara Beaver
Barbara Ann Karmanos Cancer Center	Kay Carolink
Barbara Ann Karmanos Cancer Center	Cheryl Grey
Barbara Ann Karmanos Cancer Center	Suanne Dorr
Barbara Ann Karmanos Cancer Center	Patrice Tims
Barbara Ann Karmanos Cancer Center	Brenda Kaufman
Barbara Ann Karmanos Cancer Center	Deborah Gibson
Barbara Ann Karmanos Cancer Center	Kathleen Fedoronik
Barbara Ann Karmanos Cancer Center	Melissa Giroux
Barbara Ann Karmanos Cancer Center	Ann Marie Campbell
Barbara Ann Karmanos Cancer Center	George Peck
Barbara Ann Karmanos Cancer Center	Tomoco Avilata
Barbara Ann Karmanos Cancer Center	Charlotte Brown
Barbara Ann Karmanos Cancer Center	Linsday Cleveland
Barbara Ann Karmanos Cancer Center	Nicholas Davis
Barbara Ann Karmanos Cancer Center	Denise Williams

Participating Organizations	
Barbara Ann Karmanos Cancer Center	Amber Pitts
Barbara Ann Karmanos Cancer Center	Jeannie Byrne
Barbara Ann Karmanos Cancer Center	Lisa Engles
Barbara Ann Karmanos Cancer Center	Larry Van Bello
Barbara Ann Karmanos Cancer Center	Stephen Smith
Barbara Ann Karmanos Cancer Center	Diana Michaels
Barbara Ann Karmanos Cancer Center	Joseph Uberti
Barbara Ann Karmanos Cancer Center	Kenneth Bresnan
Barbara Ann Karmanos Cancer Center	Lynne Moseley
Barbara Ann Karmanos Cancer Center	Robin Marchio
Barbara Ann Karmanos Cancer Center	Patricia Ellis
Barbara Ann Karmanos Cancer Center	Susan Udaids
Barbara Ann Karmanos Cancer Center	Sue Walker
Barbara Ann Karmanos Cancer Center	Nancy Burrows
Barbara Ann Karmanos Cancer Center	Kevin Landon
Barbara Ann Karmanos Cancer Center	Ann Payne
Barbara Ann Karmanos Cancer Center	Toni Clark
Barnes-Jewish Hospital	Dennis Fugak
Barnes-Jewish Hospital	Jason Parmentier
Barnes-Jewish Hospital	Suzanne Thibodeaux
Barnes-Jewish Hospital	Diane Sempek
Barnes-Jewish Hospital	Julia Stith
Barnes-Jewish Hospital	Heather Taylor
Barnes-Jewish Hospital	Wendy Reid
Barnes-Jewish Hospital	Grant Kramer
Barnes-Jewish Hospital	Rachel Smiley
Barnes-Jewish Hospital	John Wagoner
Barnes-Jewish Hospital	Keith Anderson
Barnes-Jewish Hospital	Jason Campbell
Barnes-Jewish Hospital	Stephanie Larson
Barnes-Jewish Hospital	Amanda Cashen
Barnes-Jewish Hospital	Cheryl Gerdy
Dana Farber Cancer Institute	Jill Tierney
Dana Farber Cancer Institute	Christina Jahl
Dana Farber Cancer Institute	Jennifer O'Riorden
Dana Farber Cancer Institute	Janet Means

Participating Organizations	
Dana Farber Cancer Institute	Audrey Quinn
Dana Farber Cancer Institute	Chris Smith
Dana Farber Cancer Institute	Eric Misthal
Dana Farber Cancer Institute	Gillian Buckley
Dana Farber Cancer Institute	Carol Capone
Dana Farber Cancer Institute	Michelle Schaffer
Dana Farber Cancer Institute	Edwin Alya
Dana Farber Cancer Institute	Kelly Boyk
Dana Farber Cancer Institute	Ellen Berlin
Dana Farber Cancer Institute	Eric Andersen
Dana Farber Cancer Institute	Jake Edelman
Dana Farber Cancer Institute	Rachel Wolfberg
Dana Farber Cancer Institute	Melissa McCullough
Dana Farber Cancer Institute	Ralph Nirette
Dana Farber Cancer Institute	Martin Jurchak
Dana Farber Cancer Institute	Eric Goranick
Dana Farber Cancer Institute	Cathy Campbell
Mount Sinai Hospital	David Gopie
Mount Sinai Hospital	Mrlene Naanes
Mount Sinai Hospital	Virginia Ross-Dodd
Mount Sinai Hospital	Sharon Tindle
Mount Sinai Hospital	Wen-Ya Hsu
Mount Sinai Hospital	Diayendu Bandyopadhuny
Mount Sinai Hospital	Laura Butler
Mount Sinai Hospital	Rita Jakbowski
Mount Sinai Hospital	Korgun Maril
Mount Sinai Hospital	Amir Steinberg
Mount Sinai Hospital	Rachel Zuckerman
Mount Sinai Hospital	Judith Archer
Mount Sinai Hospital	Kevin Landon
Mount Sinai Hospital	Victoria Rodriguez
Mount Sinai Hospital	Gayle Hughes
Mount Sinai Hospital	Samantha Skubish
Mount Sinai Hospital	Alan Levine
Mount Sinai Hospital	Vanessa Gordon
Mount Sinai Hospital	Nancy Escala

Participating Organizations	
Mount Sinai Hospital	Maria Palaaidiyil
Mount Sinai Hospital	Donald Caradone
Mount Sinai Hospital	Jennifer Silver
Mount Sinai Hospital	Laura Bai
North Shore University Hospital	Mukesh Tiwari
North Shore University Hospital	Lisa Randazzo
North Shore University Hospital	Suhui He
North Shore University Hospital	Wei Xu
North Shore University Hospital	Jamie Han
North Shore University Hospital	Eilen Fitzger
North Shore University Hospital	Laura Donahue
North Shore University Hospital	Aimee Corke
North Shore University Hospital	Miyuki Yoshide-Huy
North Shore University Hospital	Kirsten Duprez
North Shore University Hospital	Crishe Scott
North Shore University Hospital	Emily Hickson
North Shore University Hospital	Cindy Gomez
North Shore University Hospital	Michele Quintarei
North Shore University Hospital	Rachel Marano
North Shore University Hospital	R Bayer
Roger Williams Medical Center	Greg Banner
Roger Williams Medical Center	Dan Barnette
Roger Williams Medical Center	Kathy Perry
Roger Williams Medical Center	Mark Curtis
Roger Williams Medical Center	Prescilla DaSilva
Roger Williams Medical Center	Patricia Lang
Roger Williams Medical Center	Tracey Driscoll
Roger Williams Medical Center	Jason Marsden
Roger Williams Medical Center	Elisa Ferrara
Roger Williams Medical Center	Susan Morin
Roger Williams Medical Center	Chris Grimes
Roger Williams Medical Center	Gina Conti
Roger Williams Medical Center	Cheryl Dunnington
Roger Williams Medical Center	Candace Willsey
Roger Williams Medical Center	Peter Coffey
Roger Williams Medical Center	Beth Ansell

Participating Organizations	
Roger Williams Medical Center	Todd Roberts
Roger Williams Medical Center	Jennifer Parker
Rush University Medical Center	Gerald Tisdale
Rush University Medical Center	Mischa Smith
Rush University Medical Center	Erin Dowding
Rush University Medical Center	Diane Jakubiak
Rush University Medical Center	Miriam Miller
Rush University Medical Center	John Maciejewski
Rush University Medical Center	Reginald McKinnie
Rush University Medical Center	Sharon Schoenemann
Rush University Medical Center	Cathy Anderko
Rush University Medical Center	Diane Gallagher
Rush University Medical Center	Kevin McKeough
Rush University Medical Center	Gary Peksa
Rush University Medical Center	Mark K. Jaros
Rush University Medical Center	Eric Sondergaard
Rush University Medical Center	Gino DiCaro
Rush University Medical Center	Jane Krivickas
Rush University Medical Center	Frederick J Serafin
Scripps Green Hospital	Michelle Meyer
Scripps Green Hospital	Jessica Malley
Scripps Green Hospital	Laurie Cobarrubia
Scripps Green Hospital	Tom Friedman
Scripps Green Hospital	Cynthia Nelson
Scripps Green Hospital	James Mason
Scripps Green Hospital	Nancy Martin
Scripps Green Hospital	Ahuj Mahindra
Scripps Green Hospital	Emily Nagler
Scripps Green Hospital	Arjun Sehgal
Scripps Green Hospital	Jeffrey Audrey
Stanford Hospital and Clinics	Laura Jackson
Stanford Hospital and Clinics	Sally Arai
Stanford Hospital and Clinics	Trisha Jenkins
Stanford Hospital and Clinics	Hannah McClellen
Stanford Hospital and Clinics	Isiah Phillips
Stanford Hospital and Clinics	Donna Healy

Participating Organizations	
Stanford Hospital and Clinics	Michele Blazek
Stanford Hospital and Clinics	Lance Phillips
Stanford Hospital and Clinics	Colin Bucks
Stanford Hospital and Clinics	Marina Zamarian
Stanford Hospital and Clinics	Morgan Oliveira
University of California Davis Hospital	Emily Rostel
University of California Davis Hospital	Kristina Spurgeon
University of California Davis Hospital	Allison Smith
University of California Davis Hospital	Linda Kruger
University of California Davis Hospital	Richard Banagale
University of California Davis Hospital	Carol Richman
University of Chicago Medicine	Sonya Ducharma
University of Chicago Medicine	Laura Johnson
University of Chicago Medicine	Jaclyn Gideon
University of Chicago Medicine	Christopher Ott
University of Chicago Medicine	Aleja Norton-Abad
University of Chicago Medicine	James Marsicete
University of Chicago Medicine	Krista Dillingham
University of Chicago Medicine	Marc Paloma
University of Chicago Medicine	Pam Madden
University of Chicago Medicine	Keriann Kordas
University of Chicago Medicine	Elingel Aguada
University of Chicago Medicine	Mylove Mortel
University of Chicago Medicine	Jennifer Palombizio
University of Chicago Medicine	Tabitha Williams
University of Chicago Medicine	Geoffrey Woof
University of Chicago Medicine	Tim Spiegel
University of Chicago Medicine	Ursula Dolan
University of Chicago Medicine	Elisabeth Weber
University of Chicago Medicine	Nicholas Nelson
University of Chicago Medicine	Jason Petronia
University of Chicago Medicine	George Einhor
University of Chicago Medicine	Jeff Nurday
University of Chicago Medicine	Suja Stanly
University of Miami	Angeia Martinez
University of Miami	Claudette Edwards

Participating Organizations	
University of Miami	Debra Chinque
University of Miami	Ed Pombier
University of Miami	Krishna Komaduri
University of Miami	Beatriz Mesana
University of Miami	Elise James
University of Miami	Maikel Valdes
University of Miami	Amer Beittinjaneh
University of Miami	Trent Wang
University of Miami	Joseph Vota
University of Miami	Maritza Atenlar
University of Miami	Shari Cobbett
University of Miami	Vincent Torres
University of Wisconsin Health	Jon Haas
University of Wisconsin Health	John Nachuill
University of Wisconsin Health	Sarah Morrow
University of Wisconsin Health	Brad Cords
University of Wisconsin Health	Chris Corrigan
University of Wisconsin Health	Peiman Hematti
University of Wisconsin Health	Junelle Memannes
University of Wisconsin Health	Inga Hofmann

APPENDIX D: PARTICIPANT FEEDBACK

RITN Centers were asked to provide some brief feedback on an online questionnaire following the exercise. The comments below are not in any particular order and are provided unedited to avoid intent changes.

Note: The average rating provided by the participating RITN centers regarding the usefulness of this exercise was 4.92 (out of 5.0). Number of responses = 12.

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.	
Allegheny Health Network	*There is good communication and coordination between the emergency management group and the Division of Hematology group within the health system. We have strong support from our local hotel resources to assist with patient and family housing. Our inpatient and outpatient services within the Division of Hematology work well together to transition patients according to acuity.*
Barbara Ann Karmanos Cancer Center	*No Answer Provided*
Barnes-Jewish Hospital	*Strong Emergency Management team with extensive knowledge of policies and resources and extensive training and preparation. Multiple satellite facilities equipped to decrease some of the load (both outpatient with labs and follow-up and inpatient with med-onc units) from the main hospital campus*
Dana Farber Cancer Institute	*We have conducted several tabletop and full scale RITN exercises in the past few years and through that have developed novel relationships between departments that might not otherwise interact (Hem/Onc and Communications, Radiation Safety and Ethics, etc.) so communication pathways between all the involved departments are well established and strong. Everyone is very familiar with the program and collaborates well. Coordination and strong relationship between the ED and inpatient unit treating these type of patients. Communicating with hospital staff, patients/ families and other hospitals in the city.*
Mount Sinai Hospital	*Adequate Training of staff. Adequate space in the facility.*

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.	
North Shore University Hospital	*We identified the additional oncology staff resources available to be utilized within our 15-hospital health system located on Long Island. Our health system has some experience mobilizing staff for a disaster response in that we sent large number of oncology staff to assist MD Anderson during hurricane Maria.*
Robert Williams Medical Center	*One of the strengths that continue is the coordinated response state wide, the Department of Health and HARI will be helping spare head the response in the event of RWMC activation. Through continued education and RITN training we have as a program and center looked at and put policies and procedures in place in the event we are activated both in-patient and out patient.*
Rush University Medical Center	*Effective collaboration within the HICS structure and participating departments. Supportive measures for outpatient needs, including housing, psychosocial support, and family member support.*
Scripps Green Hospital	*We have the expertise and the history to make sure that we can manage these patients.*
Stanford Hospital and Clinics	*Reinforces our plan and introduces new members to our plan and to each other. Good opportunity to train on our plan. Review of our resources and capabilities.*
University of California, Davis Hospital	*UCDH is relatively unique in that we already conduct an annual radiological emergency drill as part of our support for the UCD research reactor. As a result, we have a larger number of medical staff and non-medical staff who undergo training as part of our radiological emergency medical management plan. Additionally, we have already identified staff outside our Health Physics department who could be recruited in an emergency to provide radiation safety support in a larger scale event. The floor which houses our BMT unit is also used for our I-131 therapy patients. As a result, a number of our nursing staff already have some familiarity with radiation safety.*
University of Chicago Medicine	*We have an emergency operations plan in place which can be activated in any emergency including a radiation incident. We were activated as an Ebola center in the past and will activate a similar response. We are an academic medical center with access to the following resources: a) Radiation Safety Office, b) BMT program capable of expedited HLA typing and collection for adult and pediatric patients, c) 811 licensed beds 3. We are an NDMS facility with adult and pediatric trauma 1 level ERs.*

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.	
University of Miami	*Every year when we meet for this exercise we reaffirm that our greatest strengths are our proactive attitude when it comes to being prepared for such scenario and willingness of all parties to be involved in the best practice for our institution and patient needs.*

Based on discussions today, please briefly describe the 1 or 2 challenges demonstrated by your organization's ability to respond to a radiation mass casualty incident as described in this exercise scenario.	
Allegheny Health Network	*Coordination of services within the hospital with supportive areas (dietary, materials management, etc to ensure adequate services. Proper communication of information to staff, patients, families and external agencies.*
Barbara Ann Karmanos Cancer Center	*No Answer Provided*
Barnes-Jewish Hospital	*Need for increased RITN-related training for medical, ancillary, and non-medical staff. Continue to strengthen relationship with Emergency Management and utilize resources already developed.*
Dana Farber Cancer Institute	*Outpatient management, more psych/social vs the medical management. For both outpatient and inpatient, handling the long-term nature of ARS. While we are able to clear beds to receive patients, how to handle having those beds occupied for many weeks by RITN patients would be operationally challenging for our program. The likelihood of having supply shortage during a prolonged response. Unaccompanied minors.*
Mount Sinai Hospital	*Need to develop and enhance just-in-time training. The arrival time of patients to be received could present a challenge in terms of staff on hand at that time.*
North Shore University Hospital	*One challenge identified was to ensure that the messaging was effective to communicate that there would be no risk to staff in caring for the patients.*
Robert Williams Medical Center	*Challenges continue to be housing for out patient and families as well as transportation.*

Based on discussions today, please briefly describe the 1 or 2 challenges demonstrated by your organization's ability to respond to a radiation mass casualty incident as described in this exercise scenario.	
Rush University Medical Center	*Training for staff on a regular basis including just in time training. Expand the awareness level to associated departments of the institution.*
Scripps Green Hospital	*We need to do our mock drill to ensure that we have it all practiced.*
Stanford Hospital and Clinics	*Training for staff, especially non-medical. It is difficult to do proactive training especially on this topic. California does not have as many reoccurring emergencies, like hurricanes, that east coast experiences so our collective diligence can slip from year to year.*
University of California, Davis Hospital	*Our system is not set up to accommodate outpatient transfers efficiently. In order to get a patient into our system, it is best to admit them even if we suspect that patient will ultimately be treated as an outpatient in our clinics. Our BMT unit has little ability to expand in the event of a crisis and the census is always high. We would transfer patients during the time between the IND event and when patients would start being received to make additional space. While there are rooms where an additional bed could be added in a crisis and our census expanded, we would likely only be able to accommodate a relatively small number of RITN patients during a real event.*
University of Chicago Medicine	*We do not have local housing managed by the hospital. Re-training needs given the large number of staff.*
University of Miami	*We are a small-scale facility and our program growth rate can cause saturation.*

List and briefly discuss elements to address for future RITN exercises.	
Allegheny Health Network	*Communication scripts from the RITN to share with patients, families and external agencies. Updated training resources for medical and non-medical personnel.*
Barbara Ann Karmanos Cancer Center	*No Answer Provided*

List and briefly discuss elements to address for future RITN exercises.	
Barnes-Jewish Hospital	*We used the wrong patient information sheets. If absolutely necessary to change materials, especially those with subtle alterations, should be instructed to discard previous copies. I confirmed I had the final SitMan, but I printed out extra Patient Profiles and did not use the most current version.*
Dana Farber Cancer Institute	*Recommendations for non-medical outpatient support (shelters vs hotels? public or private transportation?)*
Mount Sinai Hospital	*Cytokines (Neupogen and how it would be approved for radiation exposure).*
North Shore University Hospital	*Perhaps more information on what the public should be told...actual messaging...*
Robert Williams Medical Center	*More detail on the patient and additional CBC results to better assess the radiation dose received (requested by physician and radiation officer this year and last year).*
Rush University Medical Center	*Coordination of efforts for in house units, the Emergency Department, and outpatient services.*
Scripps Green Hospital	*None. I think it was good.*
Stanford Hospital and Clinics	*Question numbers on slides should match the numbers on sitman and survey monkey for ease of use.*
University of California, Davis Hospital	*None of the questions for this TTX addressed what we would do from the time of the incident until we anticipated patients arriving. This would be a global news story and we would be well aware in advance of the first patients arriving that the network would be activated. It would be useful to work through that in a future exercise. How does RITN plug into NDMS? As part of their command center? What does that org chart look like? Who owns/runs the PRAs in terms of medical care and coordination? Who will be transporting patients and how will they arrive? Are they currently inpatients at another facility? Whose care are they under before they are transferred to our care?*
University of Chicago Medicine	*More information about local housing from other centers. Reimbursement for services provided as well as transportation for patients when returning to home. Support available for families or caregivers accompanying patients.*

List and briefly discuss elements to address for future RITN exercises.	
University of Miami	*Continue communication between all parties and departments involved. Develop closer relationships with other institutions in the RITN to share information about best practices with each other (SOPs, staff notification methods, triage processes, etc).*

APPENDIX E: ACRONYMS

Acronym	Term
AAR	After Action Report
ARS	Acute Radiation Syndrome
ASPR	Assistant Secretary for Preparedness and Response
BMT	Bone Marrow Transplantation
CNE	Continuing Nursing Education
COA	Commission on Accreditation
DHV	Disaster Health Volunteer
FCC	Federal Coordinating Center
G-CSF	Granulocyte-Colony Stimulating Factor
Gy	Gray
HCC	Healthcare Coalition
HCS	Healthcare Standard
HCT	Hematopoietic Cell Transplantation
HEM	Hematology
HHS	Health and Human Services
HLA	Human Leukocyte Antigen
HPP	Hospital Preparedness Program
IND	Improvised Nuclear Device
IV	Intravenous
JIT	Just-In-Time
MRC	Medical Reserve Corps
NMDP	National Marrow Donor Program
NDMS	National Disaster Medical System
ONC	Oncology
ONR	Office of Naval Research
PACU	Post-Anesthesia Care Unit
PO	Orally
PRA	Patient Reception Area
RITN	Radiation Injury Treatment Network
RSO	Radiation Safety Officer
SITREP	Situation Report
SME	Subject Matter Expert
TTX	Tabletop Exercise