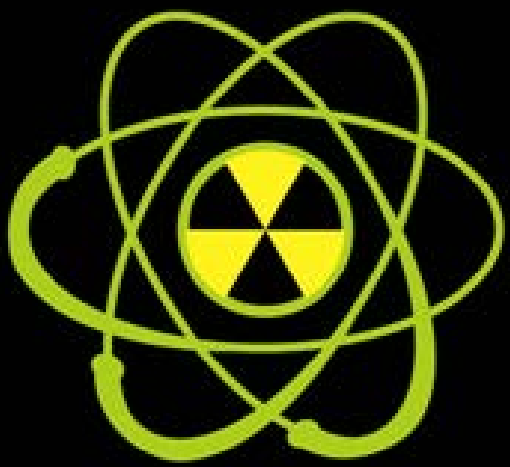
2017

After-Action Report/Improvement Plan
August 3, 2017 Web-Based



EXERCISE OVERVIEW

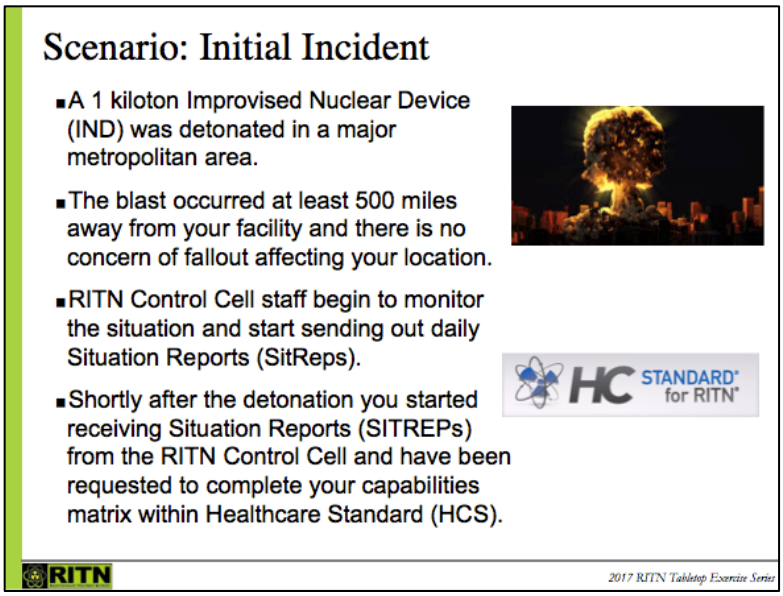
Exercise Name	2017 RITN Tabletop Exercise (TTX)
Exercise Date	August 3, 2017
Scope	This exercise is a web-based tabletop exercise planned for 2 ½ hours. Exercise play is limited to RITN facilities and their response partners' collective challenges and considerations for improved and effective response.
Mission Area(s)	Response
Capabilities	Public Health & Medical Services
Objectives	**Objective 1:** Hospital staff are able to determine their hospital's capability to receive casualties (inpatient and outpatient) through the National Disaster Medical System (NDMS) following a mass casualty radiological incident. **Objective 2:** Hospital staff are able to discuss the procedures for implementing Crisis Standards of Care (CSC) at their hospital. **Objective 3:** Hospital staff are able to describe their approaches for triaging patients and determining initial treatment actions for patients with Acute Radiation Syndrome (ARS).
Hazard	Radiological
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	See Appendix B
Point of Contact	RITN Control Cell RITN@NMDP.ORG

EXERCISE SUMMARY

On August 3, 2017, RITN centers and the RITN Control Cell participated in a tabletop exercise to discuss RITN centers planning actions for patient arrival, crisis standards of care under austere resource and medical management conditions, and medical care and treatment of arriving patients from radiological exposure. 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 (Figure 1):

Figure 1: Exercise Scenario Ground Truth

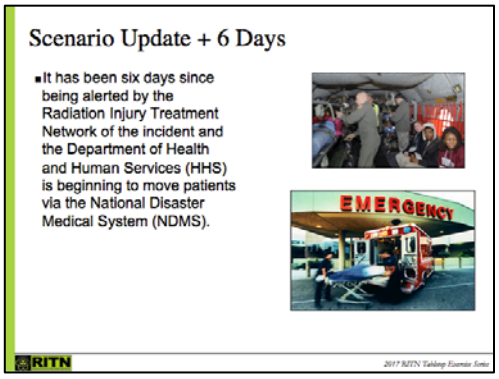


ANALYSIS OF CAPABILITIES

Module 1: Planning for Patient Arrival

Participants were provided the following update to the scenario information (Figure 2). Based on the scenario inject information, RITN Centers were asked to discuss multiple operational considerations regarding the receipt of NDMS patients. Considerations for patient receipt included aggressive changes and overflow into other hospital departments as well as repurposing previously identified space such as dormitories and gymnasiums.

Figure 2: Scenario Update Event + 6 Days

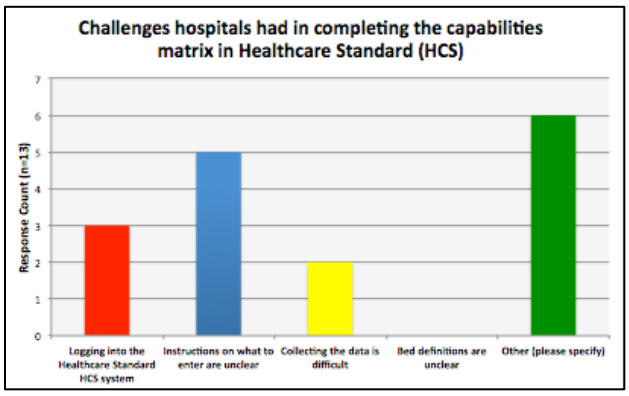


Completion of Capabilities Matrix: Approximately one-third of the participating centers (5 centers) stated no difficulty in completing the capabilities matrix. These participating centers recently had real world events and/or exercises with NDMS representatives in which data was retrieved and exchanged that would also be used to complete the capabilities matrix.

The remaining participating centers discussed the challenges they face when completing the Healthcare Standard (HCS) Capabilities Matrix (Figure 3). The challenges these centers cited included:

- Logging into the HCS System
- The numbers (i.e. the demand) are dynamic – the data changes frequently
- Difficulty determining Outpatient Supportive Care Capabilities as centers were unclear of this definition
- Difficulty in collecting data for input into the matrix
- Difficulty with interpretation of the bed definitions
- Hospital surge capacity is limited on a daily basis
- Other (i.e. number of beds will change based on the event; implementation of CSC may create challenges in completing HCS; estimating staff as well as estimating staffed beds versus available unstaffed beds; Public Health Preparedness/National Standards for State

Figure 3: HCS Challenges



and Local Planning are more applicable to government and community-based organizations and not hospitals).

Intake of Patients: Aggressive Changes: Participating centers determined the following: The number of inpatients their RITN center could receive with aggressive changes and spill-over into other areas of their hospital (such as ICU or PACU) under the assumption that alternations in the standards of care were required. Examples provided of aggressive changes included aggressive patient discharges or transfers or a delay in the normal admissions process. The number of inpatients received was reported as (Table 1):

Table 1: Intake of Patients

RITN Center	Number of Patients
Children's Hospital of Philadelphia	74
Children's Hospital of Wisconsin	24
Barnes-Jewish Hospital	30
Duke University Medical Center	130 – 170
Froedtert Memorial Lutheran Hospital	12
Medical College of Wisconsin	40 kids 70 adults
Oregon Health & Science University	115
Roswell Park Cancer Institute	40
Scripps Medical Center	25
St. Francis Hospital and Health Centers	51
University Hospitals Seidman Cancer Center	123
University of Kentucky Medical Center	Not provided
University of Pittsburgh Medical Center	30 – 50
University of Texas MD Anderson Cancer Center	25
University of Virginia Health System	25
TOTAL	**814 – 874 beds**

All RITN centers indicated that the number of patients received would be highly dependent on their medical care needs. Centers discussed the informational needs (such as staffing, type of beds needed, medical supplies) required in order for them to properly prepare to receive any NDMS patients.

Intake of Patients: Incorporating Large Facilities: After RITN centers determined the number of inpatients they could receive considering aggressive changes and spill-over, RITN centers determined the number of inpatients they could receive with the previous 2 considerations as well as implementation of crisis standards of care and incorporating large austere emergency treatment facilities previously identified (such as dormitories, gymnasiums or domed stadiums). Given these two additional considerations, all participating RITN center indicated at least a

100% increase in the number of patients received. Centers that are part of university campuses stated use of dormitories or other university spaces depending if school was in session.

Communication with the FCC: If requested by the RITN Control Cell to communicate bed availability directly to their assigned Federal Coordinating Center (FCC), all participating RITN centers were able to quickly determine their facility's bed availability and provide that information to their local FCC, but several indicated that communications with their local FCC would occur via their local healthcare coalition or local emergency management agency.

Outpatient Housing: Approximately two-thirds of the participating RITN centers indicated that hotels have been identified as part of the planning process to house outpatients during RITN activation as well as traveling family members or others that may have accompanied the transported patient; while approximately one-third of the participating RITN centers (5 centers) do not currently have hotels identified to house outpatients during a RITN activation.

Strengths

The following strengths were demonstrated:

Strength 1: All RITN centers demonstrated the capability to receive patients under a variety of special and unique circumstances such as implementation of crisis standards of care, aggressive discharges or transfers, delayed admission processes, and spill-over into other areas or departments of their facility.

Strength 2: All RITN centers demonstrated and discussed the ability to rapidly determine their immediate bed availability using electronic bed tracking systems and incorporating their local healthcare coalitions as part of the collaboration with the RITN Control Cell and their local Federal Coordinating Center.

Strength 3: All RITN centers have formal agreements currently in-place with local hotels for accommodations as well as utilizing hospital-owned apartments and other alternate housing options for outpatients during RITN activation.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: The data field definitions for the Healthcare Capabilities Matrix should be reviewed to ensure clarity. RITN centers indicated difficulty in accurately reporting the data because they were unclear, for example, on the types of patients being sent and fluctuations in their staffing levels based on the patient demand.

Area for Improvement 2: RITN centers emphasized the need to receive NDMS patient information well in advance of patient transport to the RITN Center. Awareness (or refresher) training should be provided on the NDMS program as well as the end-to-end process to prepare and transport a NDMS patient to a RITN center. The NDMS patient manifest contains the medical information needed by RITN centers to ensure their planning for patient receipt aligns

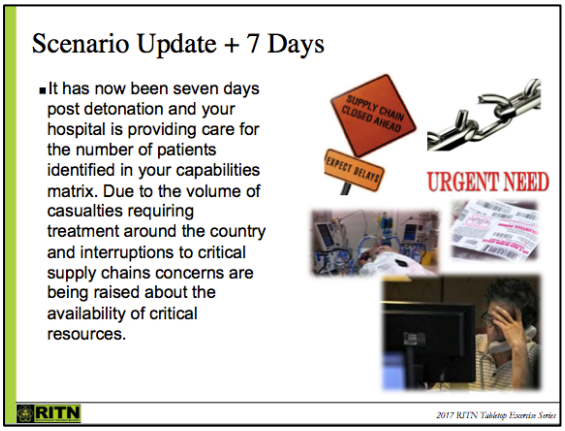
with the level and type of medical care needed. Centers would be able to accurately complete the Capabilities Matrix and plan for patient arrival.

Area for Improvement 3: All RITN centers should continue planning efforts regarding local resources (e.g. hotels, apartments, stadiums) that may be used to house outpatients during a RITN activation. Planning should include the local emergency management agency and healthcare coalition, which may be able to assist in facilitating planning discussions with the private sector for outpatient housing assistance during a RITN activation.

Module 2: Crisis Standards of Care

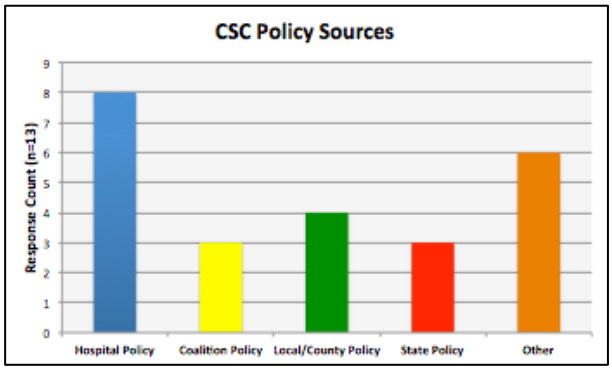
Participants were provided the following update to the scenario information (Figure 4). Based on the scenario inject information, 7 days have elapsed since the detonation and RITN centers are experiencing disruptions to their supply chains and resources are running low given the volume of casualties requiring treatment across the country.

Figure 4: Scenario Update Event + 7 Days



Implementation of Crisis Standards of Care: Nine participating RITN centers indicated having their own internal crisis standards of care policy. Of these 9 centers, 4 of them also rely on overarching guidance from their healthcare coalitions, local/county policies, and their state policies (Figure 5). The CSC hospital policies for these 9 centers were developed based on their own internal committees (such as an Ethics Committee or Disaster Committee), hospital subject matter experts (e.g. an Ethicist), and the crisis care guidance from external entities (e.g. health coalitions, state/local/county agencies). Four participating RITN centers did not currently have a CSC policy and would rely on guidance from an ad hoc committee to clarify or provisions within current surge plans with resource constraint considerations or guidance from the Governor's Office stating crisis care should be implemented.

Figure 5: CSC Policy



Nine participating RITN centers stated that a national disaster declaration is sufficient to implement crisis care at their facility and these 9 centers stated that their hospital committee has the authority to make CSC determinations; while 4 centers stated the incident management team (or incident commander) has the authority to make CSC determinations following their State's issuance of crisis care to be implemented. Nine participating RITN centers stated state, city, county, and local jurisdictions have provided ethical codes/guidance regarding crisis care; while 4 centers indicated not having any crisis care guidance from their State or city.

In the absence of CSC codes and guidance (i.e. if the scenario events occurred today), RITN centers discussed a variety of priority factors under consideration for making decisions on use of resources, such as (Table 2):

Table 2: Factors Influencing Resource Decisions

Primary Factors Influencing Resource Decisions	
Age of patient(s)	Comorbidities
Severity of exposure	Dosage
Exposure and likelihood of survival as compared to other patients within the group exposed	Availability of staffing (e.g. nursing and medical), pharmaceuticals, and laboratory supplies
Patients within the transplant system (or already in processing)	Patients who are scheduled for transplant but in complete remission with a donor selected and scheduled for donation
Patients who already have collected their own cells	

RITN centers indicated that public messaging regarding CSC would be coordinated through a joint information center given the events as described in the scenario. The hospital Communications Department, Public Relations Department, the Public Information Officer, and Liaison Officer have a significant role in developing the public messaging for the RITN center and all messaging would be coordinated at all levels (to include corporate health system public relations and state and local public health officials) to ensure and emphasize consistency.

After 2-weeks post-detonation, RITN centers discussed those laboratory surge capabilities and all centers demonstrated local and/or regional laboratory surge support. Laboratory equipment, supplies, and laboratory staff (phlebotomists, hematology medical technologists, core laboratory medical technologists, flow cytometry medical technologists, pathologists, and histology staff) was discussed to be in greatest need along with blood products. Additionally, supplies such as reagents, collection tubes, HLA supplies, blood draw supplies, and their capabilities to perform CBCs and run chemistries would be severely taxed approximately 2-weeks post-detonation and receipt of patients.

Table 3: Laboratory Surge Capacity

RITN Center	Max. CBCs with Differentials (Given Expected Resource Constraints)
Children's Hospital of Philadelphia	1,000 per day
Children's Hospital of Wisconsin	240 – 2,000 (manual vs- automated)
Barnes-Jewish Hospital	3000 per day
Duke University Medical Center	2,000 – 3,000 per day
Froedtert Memorial Lutheran Hospital	6,000 – 8,000 per day
Medical College of Wisconsin	Not provided
Oregon Health & Science University	Not provided

RITN Center	Max. CBCs with Differentials (Given Expected Resource Constraints)
Roswell Park Cancer Institute	500 per day
Scripps Medical Center	2,000 – 3,000 per day
St. Francis Hospital and Health Centers	800 per day
University Hospitals Seidman Cancer Center	3,300 per day
University of Kentucky Medical Center	Not provided
University of Pittsburgh Medical Center	2,400 per day
University of Texas MD Anderson Cancer Center	2,500 per day
University of Virginia Health System	Not provided

Given a multi-day notification of the receipt of patients, several RITN centers indicated delays should not occur, but the frequency of routine testing may be decreased. A majority of the participating RITN centers stated that all outpatient, routine testing, and chemistries would be delayed/deferred. Generally, all non-essential and non-emergent laboratory testing would be delayed or deferred given the events in the scenario and CBC with differentials, HLA testing, chemistries, and type and cross would be priorities.

Strengths

The following strengths were demonstrated:

Strength 1: RITN centers discussed existing policies or were able to quickly develop a process to assemble the appropriate guidance content, request assistance from the necessary experts or authorities, and implement crisis standards of care if needed.

Strength 2: RITN centers demonstrated plans and protocols to rapidly disseminate information to their staff and to the public and the resources to provide public messaging in multiple languages.

Strength 3: RITN centers demonstrated continuity planning to address laboratory resource shortages over an extended response timeframe to procure necessary staffing and supplies.

Strength 4: RITN centers were able to approximate a maximum number of CBC with differentials that could be processed daily in their laboratories, which at a minimum, would assist their ability to anticipate the type and amount of resource shortages to anticipate under the conditions in this scenario.

Areas for Improvement

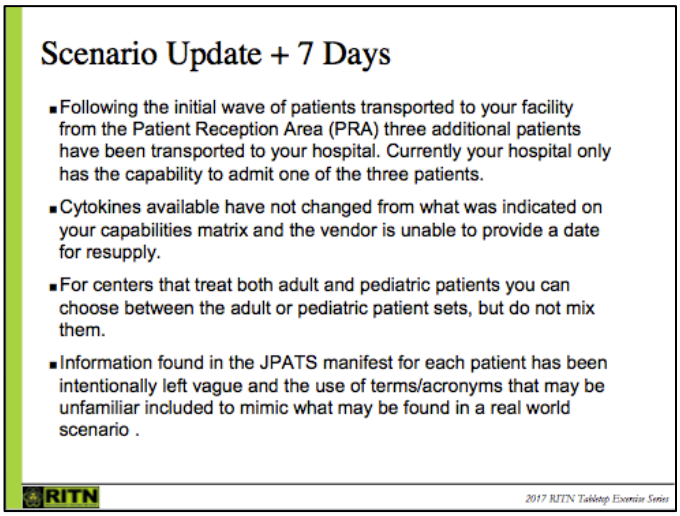
The following areas require improvement:

Area for Improvement 1: As part of improvement planning, RITN centers should review their policies or plans for CSC and ensure considerations related to the RITN program (such as the patients they may receive and impacts to their current inpatient population) are included in their crisis care policies and plans.

Area for Improvement 2: All RITN centers should review their laboratory supply chain as part of continuity of operations planning and confirm any existing laboratory supply vendor agreements that additional quantities of reagents, collection tubes, HLA supplies, blood draw supplies, and supplies related to CBCs and virology testing could be secured under the events described in this scenario. Additionally, RITN centers should identify laboratory technician/staff to augment their existing levels and initiate discussions with those local/regional healthcare partners to explore mechanisms for the RITN center to utilize their staff if needed.

Module 3: Patient Treatment

Figure 6: Scenario Update Event + 7 Days



Participants were provided the following update to the scenario information (Figure 6). Based on the scenario inject information, 3 additional patients were transported to their RITN center following the initial wave of patients from the Patient Reception Area. Hospitals were instructed that they could admit one of the three patients transported to them based on their current capabilities to medically treat and manage the patient. RITN centers were also provided with patient profiles for these 6 patients.

Medical Management of the 1 Additional Patient: Twelve RITN centers decided to assess the adult patients and admit 1 of them. The medical management of the admitted patients is as follows (Table 3):

Table 4: Adult Patient Management

Admitted Patient Management: Adults			
Decisions: Adults	**Patient 1**	**Patient 2**	**Patient 3**
Admit or Outpatient*	Yes 3 Centers	Yes 4 Centers	Yes 5 Centers
Estimated dose upon arrival**	Dose: 3.0 grey Range: 2.7 – 6.0 grey	Dose: 3.4 grey Range: 3.0 – 6.0 grey	Dose: 8.6 grey Range: 7.0 – 11.0 grey
Administer G-CSF	Yes 11 Centers	Yes 11 Centers	Yes 7 Centers
Prophylactic antimicrobials	Yes 4 Centers Acyclovir Fluconazole Levaquin Keflex Ciprofloxin Pentamidine Diflucan Vancomycin Zosyn	Yes 9 Centers Acyclovir Fluconazole Levaquin Keflex Ciprofloxin Pentamidine Diflucan Vancomycin Zosyn	Yes 4 Centers Acyclovir Fluconazole Levaquin Keflex Ciprofloxin Pentamidine Diflucan Vancomycin Zosyn
Treatment antimicrobials	Yes 9 Centers Vancomycin Zosyn Levaquin Voriconazole	Yes 9 Centers Vancomycin Zosyn Levaquin Voriconazole	Yes 7 Centers Vancomycin Zosyn Levaquin Voriconazole

Admitted Patient Management: Adults			
Decisions: Adults	**Patient 1**	**Patient 2**	**Patient 3**
	Cefepime Doxycycline	Cefepime Doxycycline	Cefepime Doxycycline
Hydration (or other treatment)	Yes	Yes	Yes
Lab work, Consultations	• HLA typing, Daily CBC with differentials, Type & screen, chemistries, metabolic panel, pregnancy test, IV fluids, antimetics and blood products • Heme/BMT consult, transplant consult, Social work, psychology • Aggressive supportive care	• Daily CBC with differentials, HLA typing, blood cultures, chemistries, glucose monitoring • Consult with infectious disease, orthopedics, diabetes, wound care management, medical oncology, endocrinology, breast cancer consult • Comorbidities (e.g. breast cancer, diabetes, leg wound) require close monitoring and would cause hospital admit	• Daily CBC with differentials, blood cultures, type and screen, intravenous fluids, HLA typing, hydration and assess for other needs, antimetics, wound care, blood products • Consults include hospice, comfort care, psychology, social services
*RITN centers did not reach consensus on patient admissions. **Centers calculated a wide range for the estimated dose upon arrival for the adult patients.			

Two RITN centers assessed the pediatric patients and decided to admit one of them. The medical management of the admitted patients is as follows (Table 4):

Table 5: Pediatric Patient Management

Admitted Patient Management: Pediatrics			
Decisions: Pediatrics	**Patient 4**	**Patient 5**	**Patient 6**
Admit or Outpatient	Yes	No	No
Estimated dose upon arrival	Dose: 4.1 – 6.0 grey	Dose: 2.7 – 4.0 grey	Dose: 3.2 - 5.0 grey
Administer G-CSF	Yes	No	Yes
Prophylactic antimicrobials*	Bactrim	Bactrim	Bactrim
Treatment antimicrobials	No	Yes Keflex	Yes 1 Center Keflex
HLA Typing	Yes	No	Yes 1 Center

Admitted Patient Management: Pediatrics			
Decisions: Pediatrics	**Patient 4**	**Patient 5**	**Patient 6**
Hydration (or other treatment)	Yes	Yes	Yes
Lab work, Consultations	• HLA typing, daily CBC with differential, CMPs, transfusion support, monitor for mucositis, pain control • Psychology consult/social services consult	• Daily CBC, CMP weekly, endocrine, possible surgery • Comorbidities will require additional consult, such as diabetes. • Social work	• Daily CBC, CMP weekly, PCR tests • Consult psychology and social work
*RITN centers did not reach consensus on the prophylactic antimicrobial to administer to each patient or on which patients receive prophylactic antimicrobials. **RITN centers would administer prophylactic antimicrobials to Patient 4; 1 RITN center would not administer prophylactic antimicrobials to Patient 5 and Patient 6.			

Strengths

The following strengths 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 should continue to discuss medical management of complex patient types such as those provided in this exercise. Consensus could not be reached among centers on a consistent estimated dose upon arrival for the adult patients. Continued discussion through training and exercises will provide an opportunity for the medical care teams to assemble and discuss the complex medical profiles of the NDMS patients they may receive given the events of this exercise scenario.

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 2017 RITN Tabletop Exercise conducted on August 3, 2017. 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: EXERCISE PARTICIPANTS

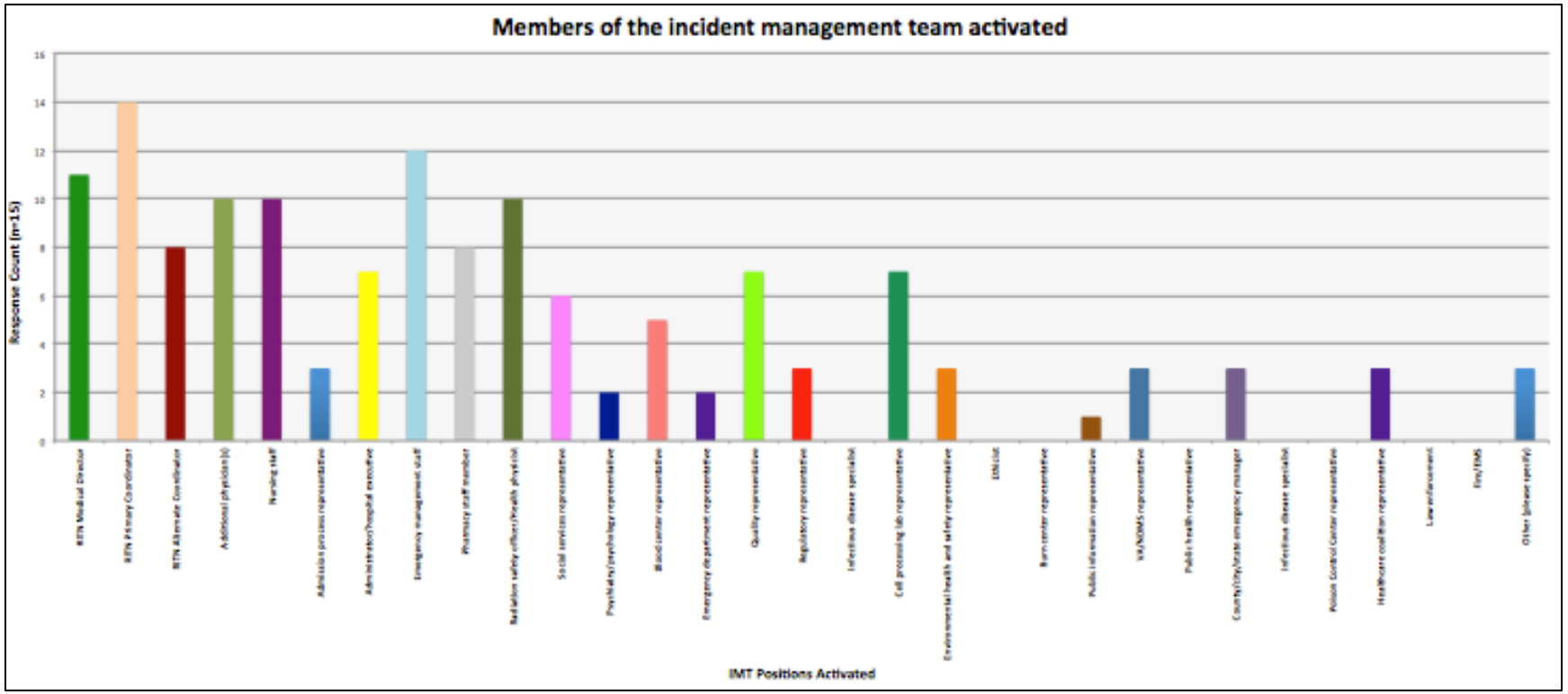
Participating Organizations	
Children's Hospital of Philadelphia	Samantha Tamburro
Children's Hospital of Philadelphia	Emily Kropp
Children's Hospital of Philadelphia	Leanee Cimato
Children's Hospital of Philadelphia	Cristina Pareja
Children's Hospital of Philadelphia	Suraksha Chandrasekhas
Children's Hospital of Philadelphia	Matthew Butler
Children's Hospital of Philadelphia	Barry Burton
Children's Hospital of Philadelphia	Hamoud Alahmari
Children's Hospital of Philadelphia	Patricia Hankins
Children's Hospital of Philadelphia	Emma Paras
Children's Hospital of Philadelphia	Nancy Bunin
Children's Hospital of Philadelphia	Joy Dvornicich
Children's Hospital of Philadelphia	Stephanie Fooks-Parker
Children's Hospital of Philadelphia	Kathleen Dici
Children's Hospital of Philadelphia	Joe Sciasci
Children's Hospital of Philadelphia	David Chen
Children's Hospital of Philadelphia	David Friedman
Children's Hospital of Wisconsin	Mike Thiel
Children's Hospital of Wisconsin	Steve Haskell
Children's Hospital of Wisconsin	Kathy Jodarski
Children's Hospital of Wisconsin	Jill Evans
Children's Hospital of Wisconsin	Karen Kutschenrenter
Children's Hospital of Wisconsin	Lisa Ferguson
Barnes-Jewish Hospital	Donna Fugate
Barnes-Jewish Hospital	Wendy Reid
Barnes-Jewish Hospital	Diane Sempec
Barnes-Jewish Hospital	Amanda Cashen
Barnes-Jewish Hospital	Emily Buehrle
Barnes-Jewish Hospital	Kendall Shultes
Barnes-Jewish Hospital	Keith Anderson
Barnes-Jewish Hospital	Jason Campbell
Barnes-Jewish Hospital	Jason Parmentier
Duke University	Courtney Polomsky
Duke University	Nelson Chao

Participating Organizations	
Duke University	Taylor Davis
Duke University	Jennifer Frith
Duke University	Michelle Hocutt
Duke University	David Marsee
Duke University	Ashley Morris-Engemann
Duke University	James Payne
Duke University	Robert Reiman
Duke University	Joel Ross
Duke University	Chad Seastrunk
Duke University	Kenneth Shaw
Duke University	Wayne Thomann
Duke University	Jeanne Verrecchio
Duke University	Terry Yoshizumi
Duke University	Jason Zivica
Froedtert Hospital	Steve Konings
Froedtert Hospital	Jamie Smith
Froedtert Hospital	Kelly Acker
Froedtert Hospital	Brenda Milota
Froedtert Hospital	Lisa Hass-Peters
Medical College of Wisconsin	Jeanie Esselman
Medical College of Wisconsin	Leo Kaiser
Oregon Health & Science University	Peggy Appel
Oregon Health & Science University	Malinda Burt
Oregon Health & Science University	Rachel Cook
Oregon Health & Science University	Sherrie Forsloff
Oregon Health & Science University	Allison Franco
Oregon Health & Science University	Kelli Goslee
Oregon Health & Science University	Brandon Hayes-Lattin
Oregon Health & Science University	Edward James
Oregon Health & Science University	Melissa Keller
Oregon Health & Science University	Richard Maziaz
Oregon Health & Science University	Keren McCord
Oregon Health & Science University	Michael Patterson
Oregon Health & Science University	Susan Slater
Oregon Health & Science University	Susan Yoder
Oregon Health & Science University	Kathleen Youn

Participating Organizations	
Oregon Health & Science University	Thomas Augst
Roswell Park Cancer Institute	Sophia Balderman
Roswell Park Cancer Institute	Diane Bartella
Roswell Park Cancer Institute	Pat Bryne
Roswell Park Cancer Institute	Tracy Chalmers
Roswell Park Cancer Institute	George Chen
Roswell Park Cancer Institute	Richard Harvey
Roswell Park Cancer Institute	Christine Howe
Roswell Park Cancer Institute	Jack Lemkuil
Roswell Park Cancer Institute	Bethann Levin
Roswell Park Cancer Institute	Lisa Privitere
Roswell Park Cancer Institute	Donna Swinnich
Roswell Park Cancer Institute	Kathleen West
Roswell Park Cancer Institute	Crisi Zavatti
Roswell Park Cancer Institute	Theresa Hahn
Scripps Medical Center	James Mason
Scripps Medical Center	Cynthia Nelson
Scripps Medical Center	Nancy Martin
Scripps Medical Center	Tom Friedman
Scripps Medical Center	Laurie Cobarrubia
Scripps Medical Center	Michelle Meyer
Scripps Medical Center	Tracy Bensley
St. Francis Hospital and Health Care	Jeff Morgan
St. Francis Hospital and Health Care	Diana Leonard
St. Francis Hospital and Health Care	Anne Edwards
University Hospitals Seidman Cancer Center	Merle Kolk
University Hospitals Seidman Cancer Center	Marlo Morris
University Hospitals Seidman Cancer Center	Bob Sabol
University Hospitals Seidman Cancer Center	Michael Mulholland
University Hospitals Seidman Cancer Center	B. Muter
University Hospitals Seidman Cancer Center	Bernadette McQuigg
University Hospitals Seidman Cancer Center	Leland Metheny
University Hospitals Seidman Cancer Center	Mark Frey
University Hospitals Seidman Cancer Center	Lori L.
University Hospitals Seidman Cancer Center	Linda Winfield
University Hospitals Seidman Cancer Center	Kathy Smith

Participating Organizations	
University Hospitals Seidman Cancer Center	Jane Reese
University Hospitals Seidman Cancer Center	Laura Knikovski
University Hospitals Seidman Cancer Center	Erica Bauer
University Hospitals Seidman Cancer Center	Deb Liedtke
University Hospitals Seidman Cancer Center	Jeffrey Luk
University of Kentucky Medical Center	Gerhard Hildebrandt
University of Kentucky Medical Center	Bryan Lemieux
University of Kentucky Medical Center	Regan Baum
University of Kentucky Medical Center	Leola Hampton
University of Kentucky Medical Center	Jennifer Christian
University of Pittsburgh Medical Center Shadyside Hospital	Lindsay Blinky
University of Pittsburgh Medical Center Shadyside Hospital	Andrew Varner
University of Pittsburgh Medical Center Shadyside Hospital	Susan Gibson
University of Pittsburgh Medical Center Shadyside Hospital	Alison Sehgal
University of Texas MD Anderson Cancer Center	Kathie Nemeth
University of Texas MD Anderson Cancer Center	Lori Griffin
University of Texas MD Anderson Cancer Center	Vhar Bharta
University of Texas MD Anderson Cancer Center	Dana Willis
University of Texas MD Anderson Cancer Center	Simvit Pavmar
University of Texas MD Anderson Cancer Center	Edward Guerrero0
University of Texas MD Anderson Cancer Center	Liz Wagar
University of Texas MD Anderson Cancer Center	Devina Patel
University of Virginia Health System	Itzia Iglesias
University of Virginia Health System	Lisa Huntsinger
University of Virginia Health System	Melody Lain
University of Virginia Health System	Leonid Lolodin
University of Virginia Health System	Steve Deborev
University of Virginia Health System	Mike Welling
University of Virginia Health System	Marc Winstead
University of Virginia Health System	Tom Berry
University of Virginia Health System	Read Panlw
University of Virginia Health System	Kara Romano
University of Virginia Health System	Clayton Alonso

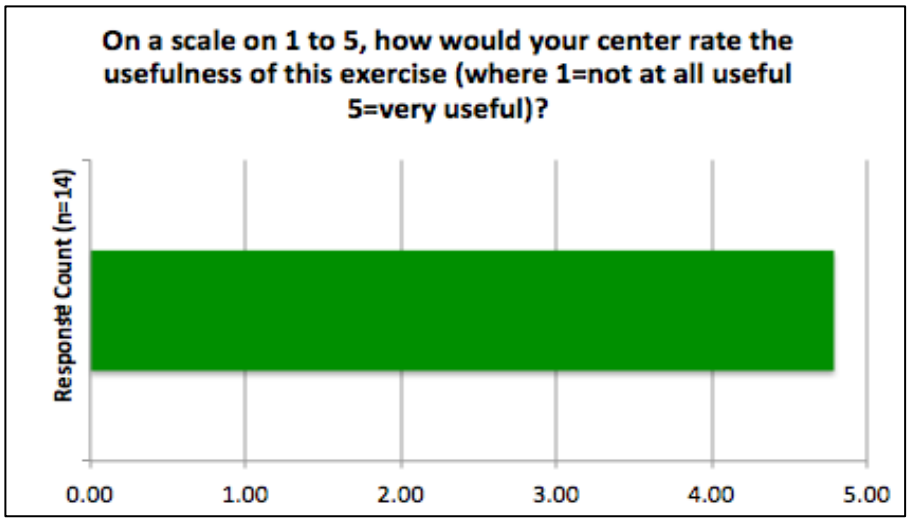
Members of the Incident Response Team Activated for the Exercise



APPENDIX C: 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 4.79 (out of 5.0). Number of responses = 14.



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.	
Barnes-Jewish Hospital	*Strong emergency management team with policy/procedures/exercises/etc. in place and ready to initiate and oversee appropriate measures. Strong multi-disciplinary teamwork with excellent communication between emergency management, physicians, in-patient nursing and management, pharmacy, labs, HLA team, etc.*
Children's Hospital of Philadelphia	*-Based on discussions during the exercise, plans and procedures that are in place for Mass Casualty Incidents and Patient High Volume management made this response easier to manage even though there are a number of unique aspects for the response to an incident involving radiological agents.*
Children's Hospital of Wisconsin/Medical College of Wisconsin	*We have emergency and disaster experienced staff and plans in place and established within the institution.*

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.	
Duke University	*We have a very good relationship and coordination between hospital emergency management, the VA/FCC, and local (county) emergency management. We are also part of a regional response coalition.*
Froedtert Hospital	*Because of our combined program across the two hospitals we would be able to do resource sharing and care for both adult and pediatric patients on campus at the two hospitals. We have a large BMT program and are experienced in outpatient transplants.*
Oregon Health & Science University	*Excellent relationship with FCC.* *Strong emergency operations plan at OHSU that would be engaged using transplant program experts*
Roswell Park Cancer Institute	*Dedicated BMT Team along with the Emergency Team Highly Trained Clinical Team.*
Scripps Medical Center	*I always enjoy hearing the other groups and taking into what we as an organization can improve on and or do.*
St. Francis Hospital and Health Care	*Many pieces are in place from previous exercises to ensure a smooth process in the event of a radiation event. Cooperation from MESH and District 5 here in Indianapolis is a great resource that we will be able to utilize.*
University Hospitals Seidman Cancer Center	*Good connectivity between departments and emergency management.*
University of Kentucky Medical Center	*We have all of the support services necessary and our institution has all necessary specialists to provide care for these patients.*
University of Pittsburgh Medical Center	*Many of the processes are already in place for a mass causality event, but this is nice to bridge the emergency preparedness folks and the heme/onc folks.*

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 Texas MD Anderson Cancer Center	*We have a lot of good resources here at our institution and many contacts to local/county resources thru the TX medical center.*
University of Virginia Health System	*Strong emergency management plan, ability to flex beds/staff, communication with internal and external emergency management at a local and state level.*

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.	
Barnes-Jewish Hospital	*We don't have resources in place to care for patients off-site. We have arrangements in place for family and for outpatients coming into our facility for treatment, but none have medical oversight if the patients should require observation or interventions. We need to pull our Ethics committees in more because of the delicacy in treating the ones most likely to survive.*
Children's Hospital of Philadelphia	*Based on discussions during this and other previous exercises, we anticipate blood and platelet shortages are anticipated. We are unsure as to what the process is to ensure that CHOP would receive a continuous blood and platelet supply.*
Children's Hospital of Wisconsin/Medical College of Wisconsin	*Number of BMT physicians, APPs, nurses and other staffing would be a concern as a limiting factor. This could limit how many patients could be received under normal SOC.*
Duke University	*We need to continue to better integrate the RITN response planning into the formal hospital emergency response SOPs.*
Froedtert Hospital	*The largest challenge would be bed space and faculty (MDs) and staff.*
Oregon Health & Science University	*Should have defined CSC guidelines and algorithms specific to this patient type defined and available for use. Housing for those patients deemed able to remain outpatient.*
Roswell Park Cancer Institute	*Blood Product Supply* *Internal communication for the triage of beds*

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.	
Scripps Medical Center	*Platelets remain the biggest issue. I think for the rest of the area we do really well at our command centers and training.*
St. Francis Hospital and Health Care	*HCS was difficult to complete on the website. Many blank boxes that don't inform the user on how to complete the matrix test. Exercise completed today (8/28) was not on the drop down box to choose from on the first page of this survey.*
University Hospitals Seidman Cancer Center	*Responding to altered standards of care, establishing systems in place for treatment reference in emergency.*
University of Kentucky Medical Center	*Capacity is our major challenge as we are an academic Trauma Center. Development of Crisis Standard of Care.*
University of Pittsburgh Medical Center	*Triaging the appropriate person based on s/s. Would be a whole panel decision on who gets what treatment.*
University of Texas MD Anderson Cancer Center	*We need more internal support for RITN. We realized that we need to have more departments involved/aware of RITN and our capabilities. The framework is there we just need to make our response more robust by ensuring all the right people are involved.*
University of Virginia Health System	*Potential pharmaceutical shortages (based on shortages we see now).*

List and briefly discuss elements to address for future RITN exercises.	
Barnes-Jewish Hospital	*Someone mentioned bringing blood bank and low blood supply into future scenarios. I think adding some ethical components with potential media interference would be in interesting shift in focus. I'm thinking of family members being upset because care is directed toward patients with the best chances of survival. How would the hospital deal with the community reaction if the media began reporting we were 'picking and choosing' some patients over others. Could really blow up if racial or social patterns were invented. This would bring other groups to the exercise, such as media services, pastoral care, spokespeople, social services, etc.*
Children's Hospital of Philadelphia	*As mentioned in the question above, blood shortages are anticipated. Future exercises whit injects addressing the shortages will be beneficial.*

List and briefly discuss elements to address for future RITN exercises.	
Children's Hospital of Wisconsin/Medical College of Wisconsin	*We would be interested in getting our blood center involved in the discussion in the future.*
Duke University	*The patient manifests and triage were a good element and we'd like to see that repeated. As a thought exercise you could ask people to identify what are the things within 50 miles of their center that might trigger a RITN type response. For us, we'll probably never be the direct target of a rad/nuke event but we do have a nuclear power plant in the area and we have a train track that runs through the center of town and right next to the hospital that carries all sorts of freight including hazardous materials. we also have several large private and government research facilities in the area that would have radiation sources and marrow toxic chemicals.*
Froedtert Hospital	*Would be interested in involving our blood center as they do the HLA typing and provide the blood products.*
Oregon Health & Science University	*Not provided.*
Roswell Park Cancer Institute	*Blood products for availability* *Staffing for all departments*
Scripps Medical Center	*Not provided.*
St. Francis Hospital and Health Care	*This is the second tabletop exercise that I have completed with the situation manual and facilitated by the Mier Group. I like the way the Modules and questions are set up and addressed. Continuing to have exercises like this in the future would be appreciated.*
University Hospitals Seidman Cancer Center	*More patient triage*
University of Kentucky Medical Center	*We need house officer and ethics representatives present at the next RITN exercise.*

List and briefly discuss elements to address for future RITN exercises.	
University of Pittsburgh Medical Center	*Not provided.*
University of Texas MD Anderson Cancer Center	*Would like to see another scenario. We always use the "most realistic" IND scenario but that may not be what actually would occur. Loved module 3 with looking at actual patients so would like to see that again.*
University of Virginia Health System	*Our team found the situational questions to be helpful in piecing all parts together. Hearing what the other centers would do in similar situations was also quite helpful.*

APPENDIX D: ACRONYMS

Acronym	Term
AAR	After Action Report
BMT	Bone Marrow Transplantation
BMP	Bone Marrow Program
CBC	Complete Blood Count
CMP	Comprehensive Metabolic Panel
CSC	Crisis Standards of Care
EKG	Electrocardiogram
FCC	Federal Coordinating Center
GCSF	Granulocyte Colony-Stimulating Factor
HCS	Healthcare Standard
HCT	Hematopoietic Cell Transplantation
HHS	Health and Human Services
HLA	Human Leukocyte Antigen
IV	Intravenous
IND	Improvised Nuclear Device
JPATS	Joint Patient Assessment and Tracking System
LFT	Liver Function Test
NMDP	National Marrow Donor Program
NDMS	National Disaster Medical System
ONR	Office of Naval Research
PACU	Post Anesthesia Care Unit
PPE	Personal Protective Equipment
RITN	Radiation Injury Treatment Network
SAT	Suicide Assessment Team
TRACES	Web based system to move and track patients
TTX	Tabletop Exercise