2015

After-Action Report/Improvement Plan

EXERCISE OVERVIEW

Exercise Name	2015 RITN Tabletop Exercise (TTX)
Exercise Date	June 17, 2015
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 centers are able to demonstrate the ability to triage and determine initial treatment actions for radiological casualties being transferred from the Federal Coordinating Center (FCC). **Objective 2: R**ITN centers are able to identify the quantity on hand of pharmaceuticals/blood products needed for treatment and identify alternate sources for resupply. **Objective 3:** RITN centers are able to describe how they will handle a surge of sibling typing and how they will coordinate typing of siblings not located at the hospital. **Objective 4:** RITN centers are able to describe the procedures for laboratory testing and treatment of patients with or without neutropenia.
Threat or Hazard	Radiological
Scenario	Radiological Exposure Device
Sponsor	Radiation Injury Treatment Network (RITN) National Marrow Donor Program (NMDP) Office of Naval Research (ONR)
Participating Organizations	Banner-University Medical Center – Phoenix, AZ Cleveland Clinic Foundation – Cleveland, OH Massachusetts General Hospital – Boston, MA Mount Sinai Hospital – New York, NY

Strong Memorial Hospital – Rochester, NY
University of California San Francisco Medical Center – San Francisco, CA
University of Colorado Hospital – Boulder, CO
University of Mississippi Medical Center – Jackson, MS
University of North Carolina Hospitals – Chapel Hill, NC
University of Pennsylvania Medical Center – Philadelphia, PA
University of Pittsburgh Medical Center – Pittsburgh, PA
Western Pennsylvania Cancer Institute – Pittsburgh, PA

Point of Contact

RITN Control Cell
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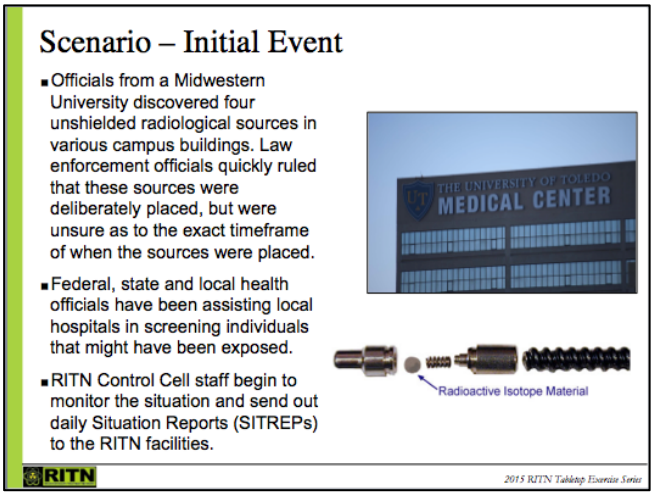
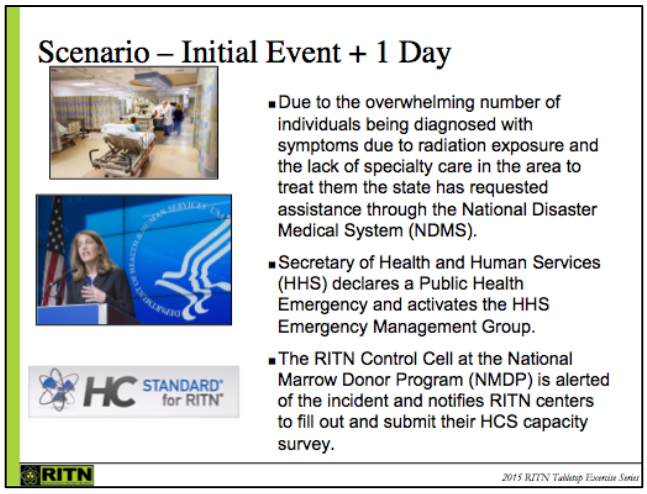
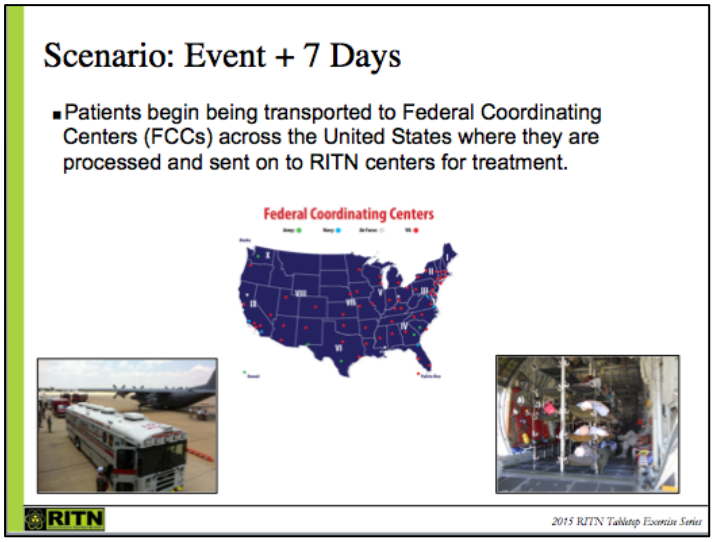
EXERCISE SUMMARY

On June 17, 2015, RITN centers and the RITN Control Cell participated in a tabletop exercise to discuss initial triage and treatment of transported patients who were exposed to a radiological exposure device. 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:





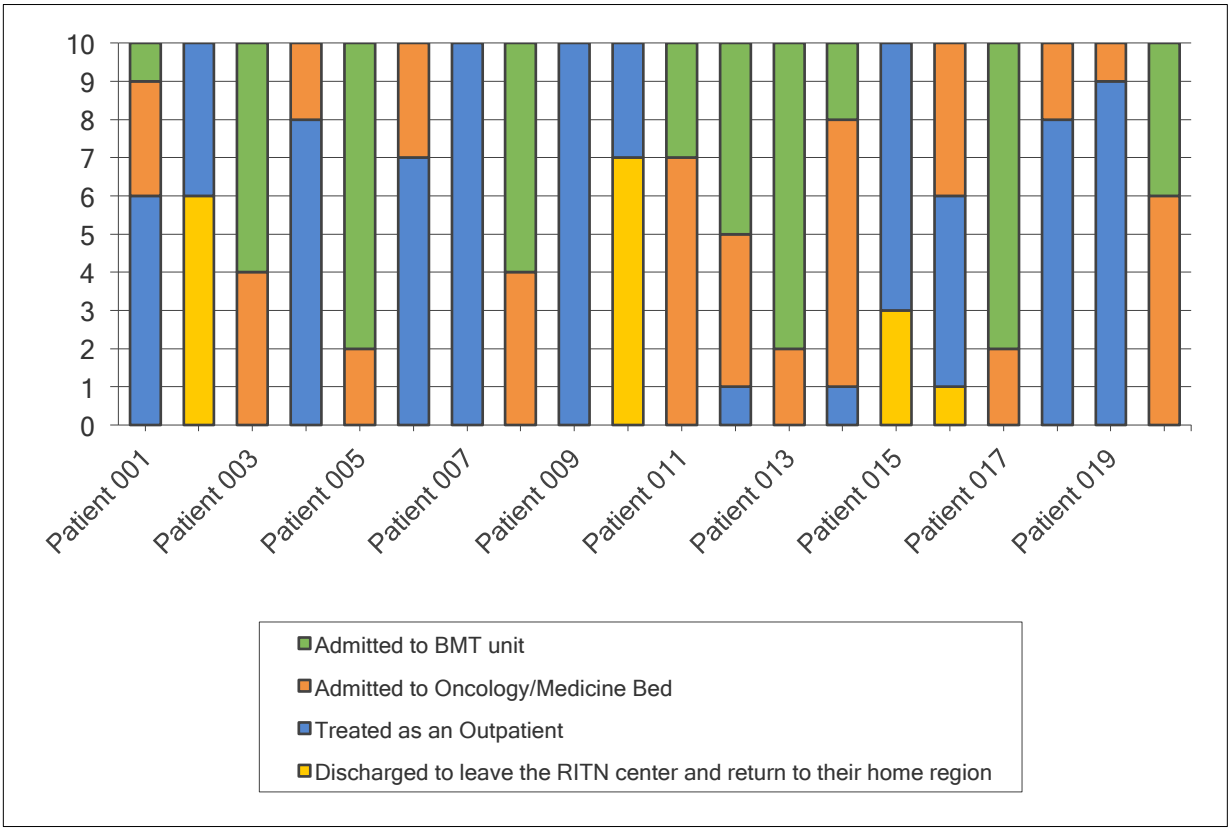


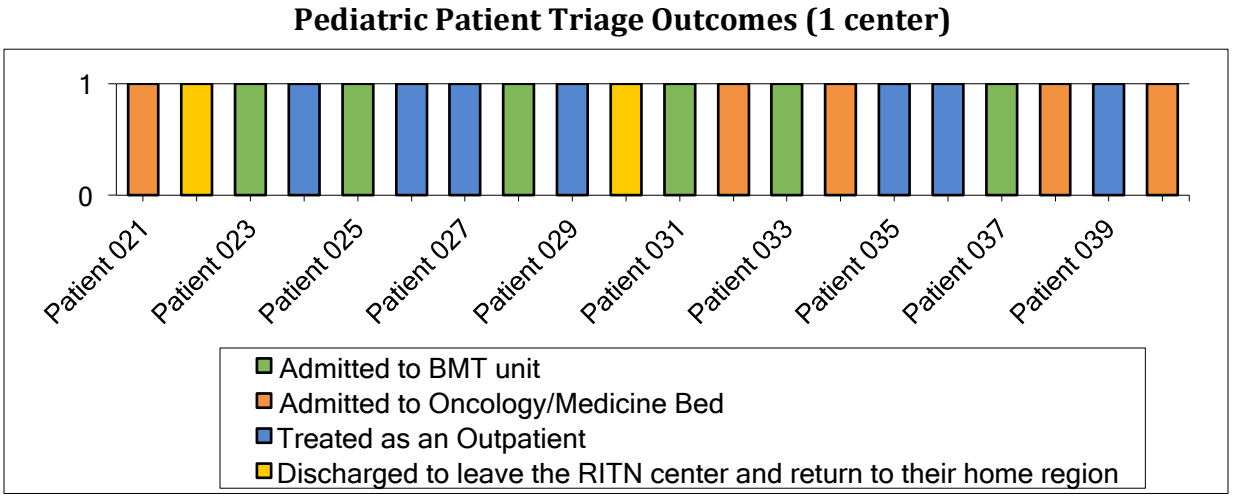
ANALYSIS OF CAPABILITIES

Question Block 1: Triage and Treatment of Patients

Triage and Treatment: The large RITN centers with significantly resourced transplant programs determined triage and treatment could be provided for both adult and pediatric patients (Appendix A). Generally, patient cohort was one of the first incident command decisions made as a resource conservation measure and patients would not be admitted unless severe complications were observed; therefore a neutropenic patient would be automatically mean hospital admission. Comorbidities as well as patient caregiver competency were two considerations discussed in the overall medical management process.

Adult Patient Triage Outcomes (10 centers)





For patients that were triaged and sent back to their home region (or needed to see the results of 1 more blood test), in-house social services would be engaged to initiate the coordination of medical care and observation in these patient's hometowns. Further detail regarding follow-up medical care and patient transport services to their hometown was not discussed.

Lastly, participating centers were unclear whether or not they would receive pediatric patients regardless of their capability to provide specialty pediatric medical care. The NDMS Program would coordinate patient distribution at the Federal Reception Center (FCC).

Strengths

The following strengths were demonstrated:

Strength 1: All RITN centers successfully triaged and treated all patients that would present at their facility.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: RITN should determine from the NDMS Program their policy on distribution of pediatric patients to facilities that do not have the capability to provide pediatric medical care. RITN centers should be informed of the NDMS Program policy.

Area for Improvement 2: RITN centers should identify the entities responsible for coordinating transport and continued medical management of those patients released to return to their home regions.

Question Block 2: Lab Draws and Pharmaceuticals

Outpatient Lab Draws: Outpatient lab draws will be conducted within all the participating centers either on the transplant unit floor or at one of their onsite clinics. All centers had processes in place to address the surge in ordered blood draws.

Housing: All participating centers demonstrated multiple housing alternatives for outpatients and their families. All centers stated involvement of social services along with existing partnerships with community organizations as the first step to address housing issues such as the American Red Cross and the Ronald McDonald House. All centers suggested local hotels as a final alternative though availability may also be an issue depending on time of year, day(s) of the week, and tourism demands. Several centers questioned payment of hotel bills if hotels were the only option available to outpatients and their families. All facilities would encounter an issue if medium and long-term housing is needed to include the financial burden placed on patients, their families, and/or the centers.

Blood Products: According to current procedures, all centers stated patients would receive irradiated and leukoreduced blood products.

G-CSF Stocks: Currently, all the participating centers have sufficient stockpiles of G-SCF. Specific amounts for those that responded are as follows:

RITN Center	Quantity
Banner – University Medical Center	6,000 mg
Massachusetts General Hospital	Approximately 40 mg Filgrastim and 80 mg TBO-Filgrastim
Mount Sinai Hospital	19.86 mg
University of Pennsylvania Medical Center	Enough vials to sustain the influx of patients
University of North Carolina Hospitals	78 mg
Strong Memorial Hospital	30,000 mcg (inpt)

Additionally, wholesalers and suppliers are able to provide rapid re-supply.

Patient Increase: The additional 20 patients would not constitute a significant increase in the need for G-CSF; all centers reported an increase of 15 mg or less in their usage. Instead, an increase in demand would be noted and monitored and depended on the weight of the 20 patients, but all centers stated adequate management to treat this surge.

Vial Splitting: Several centers indicated not splitting vials as part of normal protocols, but all centers, but all centers currently possess protocols to reduce G-CSF waste by splitting vials if needed.

Pharmaceuticals: The 20 additional patients would not introduce added risk to pharmaceutical supply (anti-bacterial, anti-fungal, anti-HSV, or Anti-PCP) to a majority of the centers; two centers indicated a risk in the supplies of levofloxacin, fluconazole, acyclovir, and Bactrim. Additionally, none of these pharmaceuticals are reported as being in short supply or on back order from the manufacturer. If supplies became low, requests for re-supply would be coordinated through existing healthcare coalitions, local and regional transplant community networks, local university hospitals and healthcare systems.

One center demonstrated confusion regarding the process to request assets if needed given this scenario. The RITN Program indicated that centers should continue to follow their current protocols to request resources (such as through local healthcare coalitions and local and state agencies for resource requests).

Strengths

The following strengths were demonstrated:

Strength 1: RITN possess the current capabilities and capacities to address a range of medical needs for a surge of 20 patients exposed to a RED to include lab draws, outpatient/family housing, existing cache of G-CSF, and specific pharmaceuticals.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: RITN centers should address any medium and long-term housing issues that outpatient and their families from outside the region may face if the only housing alternative is local hotels. None of the centers discussed plans to address medium and long-term housing issues for these patients.

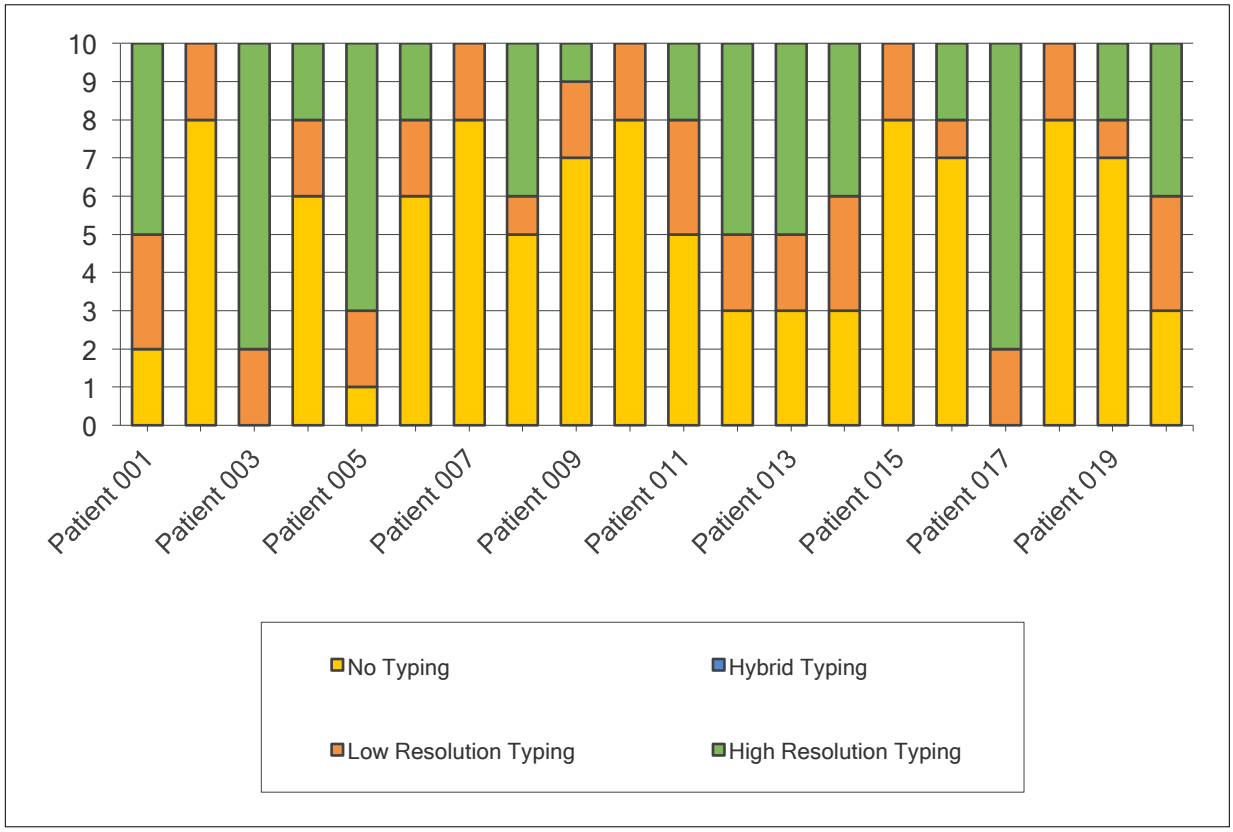
Area for Improvement 2: As part of continued response planning, determine the level of support community non-profit organizations, such as the Ronald McDonald House, can provide regarding family housing support. Planning components to address may include staffing needs, resource levels and re-supply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

Area for Improvement 3: RITN Program should continue to increase awareness for RITN centers regarding the process to request and receive assets from either the RITN Program and/or the NDMS Program. Centers demonstrated confusion on the process to request assets and whether or not they are to follow normal protocols within their hospitals/healthcare coalitions/county/state or whether a separate process existed for RITN centers in this type of

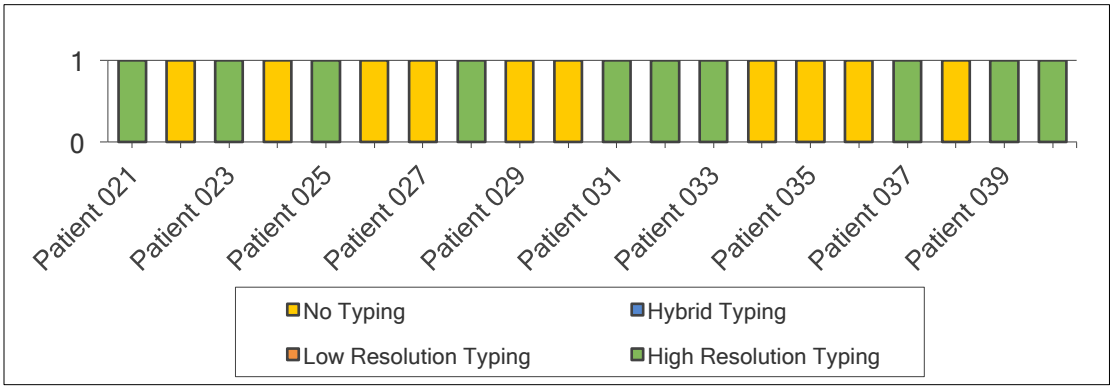
event. The RITN Program reinforced that RITN centers should continue to follow their local protocols to request assets.

Question Block 3: HLA Typing

HLA Typing: The patients admitted to the transplant units would undergo immediate high resolution HLA typing. See below for HLA typing determinations by facility.



Below are the typing decisions for the pediatric hospital (University of California – San Francisco Medical Center) for the 20 pediatric patients triaged and treated.



Sample Retrieval: Although RITN centers prefer blood sample, all centers indicated use of either blood sample or buccal swab for patient HLA typing.

Laboratory: Several RITN centers have capabilities to perform the HLA typing in-house. Those without this internal typing capability, external laboratories are used and contracts were stated to be current.

Timing of Results: Low resolution typing and high resolution is 3 – 5 days turnaround for results reporting with an additional day to complete all high resolution typing with a request for staffing assistance (laboratory technicians) to process the samples. If samples are sent to an external laboratory, the turnaround time for results is an average of 5 – 7 days.

Siblings: Hospital staff such as a search coordinator arranges sibling typing for those who do not live within the region. Buccal swabs are included with instruction for overnight mailing from and to the RITN center intended for high resolution typing.

Surge: Not all RITN centers would rely on the NMDP if sibling typing were needed for more than 100 samples. Five of the RITN centers would rely on the NMDP for collection.

Donor Assistance: Any donor assistance needed would be coordinated with NMDP. Generally, sibling donors will not be transplant matches (in more than 50% of the cases) and centers would heavily rely on NMDP for donor match identification, logistics (couriers, transportation), physical exams, and workups (such as consent forms, interviews).

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.

CONCLUSION

This report augments existing planning/training/exercising programs related to RITN center triage and medical management of radiologically exposed patients transported to their center. The strengths validate well-established aspects of the plans while the opportunities for improvement provide information to enhance, refine, or improve existing plans, protocols, 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: PATIENT LISTS AND TRIAGE DECISIONS

Adult Patients

Adult Patient Clinical Profile	Banner – University Medical Center	Cleveland Clinic Foundation	Mass General Hospital	Mount Sinai Hospital	Strong Memorial Hospital	Univ of Colorado Hospital	Univ of MS Medical Center	UNC Hospitals	Univ of PA Medical Center	Western PA Cancer Institute
Patient ID: 001 Sex: Male Age: 22 Height: 6'1" Weight: 180lbs Comorbidities/Symptoms: None **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 45 Granulocytes: 0.8 Lymphocytes: 0.2	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient
Patient ID: 002 Sex: Male Age: 19 Height: 5'8" Weight: 245lbs Comorbidities/Symptoms: Diabetes **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 280 Granulocytes: 5 Lymphocytes: 2.00	Treated as an Outpatient	Discharged to leave the RITN center and return to their home region	Treated as an Outpatient	Discharge to leave the RITN center and return to their home region	Treated as an Outpatient	Treated as an Outpatient	Discharge to leave the RITN center and return to their home region	Discharge to leave the RITN center and return to their home region	Treated as an Outpatient	Discharge to leave the RITN center and return to their home region
Patient ID: 003 Sex: Female Age: 22 Height: 5'6" Weight: 135lbs Comorbidities/Symptoms: Fever, stomatitis **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 18 Granulocytes: 0.4 Lymphocytes: 0.1	Admitted to Oncology/Medicine Bed	Admitted to Oncology/Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit
Patient ID: 004 Sex: Male Age: 31 Height: 5'11" Weight: 170lbs Comorbidities/Symptoms: None **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 100 Granulocytes: 1 Lymphocytes: 0.4	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient

Patient ID: 005 Sex: Male Age: 64 Height: 5'10" Weight: 170lbs Comorbidities/Symptoms: Hypertension, coronary artery disease, diarrhea, stomatitis **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 10 Granulocytes: 0.1 Lymphocytes: 0.01	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit
Patient ID: 006 Sex: Female Age: 55 Height: 5'9" Weight: 140lbs Comorbidities/Symptoms: Rheumatoid arthritis **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 70 Granulocytes: 1.2 Lymphocytes: 0.3	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed
Patient ID: 007 Sex: Female Age: 21 Height: 5'6" Weight: 125lbs Comorbidities/Symptoms: Severe depression **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 165 Granulocytes: 1.6 Lymphocytes: 0.5	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient
Patient ID: 008 Sex: Female Age: 73 Height: 5'6" Weight: 155lbs Comorbidities/Symptoms: Multilobar pneumonia, fever, cough **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 12 Granulocytes: 0.2 Lymphocytes: 0.0	Admitted to Oncology/Medicine Bed	Admitted to Oncology/Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to BMT unit
Patient ID: 009 Sex: Male Age: 61 Height: 5'9" Weight: 175 Comorbidities/Symptoms: None **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 100 Granulocytes: 1.1 Lymphocytes: 0.5	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient

Patient ID: 010 Sex: Male Age: 20 Height: 6'4" Weight: 195lbs Comorbidities/Symptoms: Crohn's disease **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 190 Granulocytes: 7 Lymphocytes: 2.10	Treated as an Outpatient	Treated as an Outpatient	Discharged to leave the RITN center and return to their home region	Discharged to leave the RITN center and return to their home region	Treated as an Outpatient	Discharged to leave the RITN center and return to their home region	Discharged to leave the RITN center and return to their home region	Treated as an Outpatient	Treated as an Outpatient	Discharge to leave the RITN center and return to their home region
Patient ID: 011 Sex: Female Age: 74 Height: 5'1" Weight: 115lbs Comorbidities/Symptoms: Stage IV breast cancer, anal fissure, fever **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 15 Granulocytes: 0.1 Lymphocytes: 0.03	Admitted to Oncology/Medicine Bed	Admitted to Oncology/Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit
Patient ID: 012 Sex: Female Age: 57 Height: 5'7" Weight: 315lbs Comorbidities/Symptoms: Morbid obesity, hypertension, diabetes **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 60 Granulocytes: 0.4 Lymphocytes: 0.2	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit
Patient ID: 013 Sex: Female Age: 24 Height: 5'4" Weight: 135lbs Comorbidities/Symptoms: ITP, diarrhea **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 4 Granulocytes: 0.1 Lymphocytes: 0.0	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit
Patient ID: 014 Sex: Male Age: 57 Height: 6'2" Weight: 180lbs Comorbidities/Symptoms: Fever, rhinorrhea **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 95 Granulocytes: 0.7 Lymphocytes: 0.3	Admitted to BMT unit	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed

Patient ID: 015 Sex: Male Age: 22 Height: 5'2" Weight: 135lbs Comorbidities/Symptoms: None **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 110 Granulocytes: 1.5 Lymphocytes: 1	Treated as an Outpatient	Discharged to leave the RITN center and return to their home region	Treated as an Outpatient	Discharge to leave the RITN center and return to their home region	Treated as an Outpatient	Discharge to leave the RITN center and return to their home region	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient
Patient ID: 016 Sex: Female Age: 81 Height: 5' Weight: 150lbs Comorbidities/Symptoms: Glaucoma, Parkinson's, UTI **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 78 Granulocytes: 0.9 Lymphocytes: 0.8	Admitted to Oncology /Medicine Bed	Discharged to leave the RITN center and return to their home region	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed
Patient ID: 017 Sex: Male Age: 20 Height: 6'2" Weight: 170lbs Comorbidities/Symptoms: Anorexia, fatigue, stomatitis **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 3 Granulocytes: 0.1 Lymphocytes: 0.01	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit
Patient ID: 018 Sex: Female Age: 66 Height: 5'4" Weight: 140lbs Comorbidities/Symptoms: COPD, history of larynx cancer, oral HSV lesion **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 80 Granulocytes: 1.1 Lymphocytes: 0.5	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed
Patient ID: 019 Sex: Male Age: 46 Height: 5'6" Weight: 150lbs Comorbidities/Symptoms: None **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 135 Granulocytes: 1 Lymphocytes: 0.25	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient

Patient ID: 020 Sex: Male Age: 23 Height: 5'2" Weight: 185lbs Comorbidities/Symptoms: Down syndrome, asthma **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 60 Granulocytes: 0.3 Lymphocytes: 0.2	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit

Pediatric Patients

Pediatric Patient Clinical Profile	UCSF Medical Center
Patient ID: 021 **Sex: Male Age: 6 Height: 3'10" Weight: 45lbs** Comorbidities/Symptoms: None **Lab results upon arrival at your center**: *all results are represented as ×10⁹ C/L* **Platelets: 45 Granulocytes: 0.8 Lymphocytes: 0.2**	Admitted to Oncology / Medicine Bed
Patient ID: 022 Sex: Male Age: 9 Height: 4'7" Weight: 75lbs Comorbidities/Symptoms: Diabetes **Lab results upon arrival at your center**: *all results are represented as ×10⁹ C/L* **Platelets: 280 Granulocytes: 5 Lymphocytes: 2.00**	Discharged to leave the RITN center and return to their home region
Patient ID: 023 Sex: Female Age: 3 Height: 3'2" Weight: 35lbs Comorbidities/Symptoms: Fever, stomatitis **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 18 Granulocytes: 0.4 Lymphocytes: 0.1	Admitted to BMT unit
Patient ID: 024 Sex: Male Age: 7 Height: 4'3" Weight: 60lbs Comorbidities/Symptoms: None **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 100 Granulocytes: 1 Lymphocytes: 0.4	Admitted to Oncology / Medicine Bed
Patient ID: 025 Sex: Male Age: 5 Height: 3'5" Weight: 45lbs Comorbidities/Symptoms: Kawasaki's in remission, diarrhea, stomatitis **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 10 Granulocytes: 0.1 Lymphocytes: 0.01	Admitted to BMT unit
Patient ID: 026 Sex: Female Age: 5 Height: 3'7" Weight: 40lbs Comorbidities/Symptoms: Asthma **Lab results upon arrival at your center:** *all results are*	Admitted to Oncology / Medicine Bed

Pediatric Patient Clinical Profile	UCSF Medical Center
represented as ×10⁹ C/L Platelets: 70 Granulocytes: 1.2 Lymphocytes: 0.3	
Patient ID: 027 Sex: Female Age: 4 Height: 3'5" Weight: 40lbs Comorbidities/Symptoms: None **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 165 Granulocytes: 1.6 Lymphocytes: 0.5	Treated as an Outpatient
Patient ID: 028 Sex: Female Age: 11 Height: 4'9" Weight: 100lbs Comorbidities/Symptoms: Multilobar pneumonia, fever, cough **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 12 Granulocytes: 0.2 Lymphocytes: 0.0	Admitted to BMT unit
Patient ID: 029 Sex: Male Age: 7 Height: 4'1 Weight: 55lbs Comorbidities/Symptoms: None **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 100 Granulocytes: 1.1 Lymphocytes: 0.5	Treated as an Outpatient
Patient ID: 030 Sex: Male Age: 13 Height: 5'2" Weight: 135lbs Comorbidities/Symptoms: Crohn's disease **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 190 Granulocytes: 7 Lymphocytes: 2.10	Discharged to leave the RITN center and return to their home region
Patient ID: 031 Sex: Female Age: 14 Height: 5'6" Weight: 120lbs Comorbidities/Symptoms: Anal fissure, fever **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 15 Granulocytes: 0.1 Lymphocytes: 0.03	Admitted to BMT unit
Patient ID: 032 Sex: Female Age: 8 Height: 4'2" Weight: 110lbs Comorbidities/Symptoms: Morbid obesity **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 60 Granulocytes: 0.4 Lymphocytes: 0.2	Admitted to Oncology/Medicine Bed
Patient ID: 033 Sex: Female Age: 11 Height: 4'8" Weight: 95lbs Comorbidities/Symptoms: ITP, diarrhea **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 4 Granulocytes: 0.1 Lymphocytes: 0.0	Admitted to BMT unit
Patient ID: 034 Sex: Male Age: 14 Height: 6'1" Weight: 170lbs Comorbidities/Symptoms: Fever, rhinorrhea **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 95 Granulocytes: 0.7 Lymphocytes: 0.3	Admitted to Oncology/Medicine Bed
Patient ID: 035 Sex: Male Age: 10 Height: 4'5" Weight: 65lbs	Discharged to leave the RITN center and return to their home region

Pediatric Patient Clinical Profile	UCSF Medical Center
Comorbidities/Symptoms: None **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 110 Granulocytes: 1.5 Lymphocytes: 1	
Patient ID: 036 Sex: Female Age: 9 Height: 4'6" Weight: 85lbs Comorbidities/Symptoms: Congenital blindness **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 78 Granulocytes: 0.9 Lymphocytes: 0.8	Discharged to leave the RITN center and return to their home region
Patient ID: 037 Sex: Male Age: 12 Height: 4'9" Weight: 55lbs Comorbidities/Symptoms: Anorexia nervosa, fatigue, stomatitis **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 3 Granulocytes: 0.1 Lymphocytes: 0.01	Admitted to BMT unit
Patient ID: 038 Sex: Female Age: 7 Height: 3'11" Weight: 60lbs Comorbidities/Symptoms: Acute asthma exacerbation **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 80 Granulocytes: 1.1 Lymphocytes: 0.5	Treated as an Outpatient
Patient ID: 039 Sex: Male Age: 15 Height: 5'9" Weight: 130lbs Comorbidities/Symptoms: None **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 135 Granulocytes: 1 Lymphocytes: 0.25	Admitted to Oncology/Medicine Bed
Patient ID: 040 Sex: Male Age: 6 Height: 3'10" Weight: 50lbs Comorbidities/Symptoms: Down syndrome, asthma **Lab results upon arrival at your center:** *all results are represented as ×10⁹ C/L* Platelets: 60 Granulocytes: 0.3 Lymphocytes: 0.2	Admitted to Oncology/Medicine Bed

APPENDIX B: IMPROVEMENT PLAN

This improvement plan template has been developed specifically for the RITN centers participating in the 2015 RITN Tabletop Exercise conducted on June 17, 2015. 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.

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Members of the Incident Response Team Activated for the Exercise

Position	Banner – University Medical Center	Cleveland Clinic Foundation	Mass General Hospital	Mount Sinai Hospital	Strong Memorial Hospital	UCSF Medical Center	Univ of Colorado Hospital	Univ of MS Medical Center	UNC Hospitals	Univ of PA Medical Center	Western PA Cancer Institute
RITN Medical Director	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔
RITN Primary Coordinator		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
RITN Alternate Coordinator			✔	✔	✔	✔		✔	✔	✔	✔
Additional physician(s)		✔	✔		✔	✔	✔	✔	✔		✔
Nursing staff		✔	✔	✔	✔	✔	✔	✔	✔		✔
Admission process rep	✔				✔	✔	✔			✔	✔
Admin / hospital executive			✔		✔			✔	✔	✔	
Emergency mgt staff	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Pharmacy staff member	✔	✔	✔		✔			✔	✔		✔
Radiation safety officer / Health physicist		✔	✔	✔		✔				✔	
Social services rep					✔				✔		
Psychiatry/ psychology rep											
Blood center rep		✔		✔	✔				✔		
Emergency department rep			✔					✔		✔	✔
Quality rep		✔	✔		✔			✔	✔		
Regulatory rep											
Infectious disease specialist							✔		✔		
Cell processing lab rep	✔	✔		✔	✔	✔					✔
Environ health and safety rep	✔	✔	✔			✔	✔		✔		
Ethicist											
Burn center rep											✔
Public information rep											
VA/NDMS rep	✔										
Public Health rep											
County/city /state emergency manager					✔				✔		
Poison control center rep											

Position	Banner – University Medical Center	Cleveland Clinic Foundation	Mass General Hospital	Mount Sinai Hospital	Strong Memorial Hospital	UCSF Medical Center	Univ of Colorado Hospital	Univ of MS Medical Center	UNC Hospitals	Univ of PA Medical Center	Western PA Cancer Institute
Healthcare coalition rep		✔									
BMT coordinator											

APPENDIX D: 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. 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 for this exercise was 4.91 (out of 5.0).

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.	
Banner – University Medical Center	*Participants were very excited that this drill was strongly clinically based. There was time to discuss options on various patients.*
Cleveland Clinic Foundation	*Our main strength is our depth of resources, since we are a hospital system and emergency management is encompasses the entire system, there are many options plenty of resources for most disaster scenarios.*
Massachusetts General Hospital	*1.Excellent communication between the various disciplines that would be involved in such a response. 2. Abundant resources including supplies of medications, staff, and hospital facilities. 3. Given the size of our institution – many mass casualty plans are currently in place – i.e. have the capacity to set up triage areas and process blood work in satellite clinics that could be set up on site with short notice. Also do not expect any issues with obtaining medications, processing samples or treating the 20 patients discussed in the scenarios – would be able to absorb 20 patients little change to our current work flows.*
Mount Sinai Hospital	*1) NYULMC staff were able to triage and develop an initial treatment plan for the patients presented. There was also familiarity with the actions that would need to be taken to deal with the surge in patients including the need for isolation rooms and nursing coverage. 2) NYULMC staff were able to quickly assess and report on quantities on hand as well as describe the process for ordering further supplies*
Strong Memorial Hospital	*1.We have a comprehensive Emergency Prepared Program in our hospital that we are actively a part of, including a large number of community resources that are aware of RITN (i.e. Dept. of Public Health) 2. In house resources i.e., HLA lab)*

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 California San Francisco Medical Center	*Strategic coordination of resources and communication processes was handled very well, as well as the processing of patients and prioritization of resources.*
University of Colorado Hospital	*Extent of resources that can be committed to patient care. Multi-disciplinary approach to care.*
University of Mississippi Medical Center	*Overall I think we are ready to respond to a radiation mass casualty incident; however we all know when it actually happens things will be hectic at first since all we have done are exercises. it will test our true ability to function in our role not just going through the motions. Real time is stressful and chaotic, but can be handled with ease when the facility is prepared. We rely heavily on our ED for guidance.*
University of North Carolina Hospitals	*We are a Level 1 trauma center, a large burn center, and a 50-bed cancer hospital. We have the capacity to expand if needed in outpatient settings. Also work closely with outside emergency services from local counties. We have participated now in 6-7 tabletop exercises which has allowed us to network with in our owe hospital to involve many different departments and areas with in our healthcare system.*
University of Pennsylvania Medical Center	*- Capacity management for the influx of patients - Clinical abilities to care for the patients and monitor them through count recovery or SCT.*
Western Pennsylvania Cancer Institute	*Our center is part of a multi-hospital system; we would be able to request the assistance and supplies from our system hospitals and warehouse.*

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.	
Banner – University Medical Center	*No response provided*
Cleveland Clinic Foundation	*What we did learn from this exercise was that we need to add our Tissue Typing lab to our Emergency and Disaster Plan and determine threshold numbers at which we might need outside assistance for tissue typing.*
Massachusetts General Hospital	*1. Budgetary constraints. 2. Education of staff challenges would be faced if the volume of patients seen at MGH*

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.	
	increased – i.e. > 100 patients.
Mount Sinai Hospital	*These services (typing) are contracted using outside vendors. NYULMC should determine if the vendors have contingency plans with vendors and how a surge would be handled.*
Strong Memorial Hospital	*Streamlining communication and coordination of initial incident (between day 0-7).*
University of California San Francisco Medical Center	*One challenge is that we need more participation by other groups within UCSF who would become involved in such an incident.*
University of Colorado Hospital	*Managing large number of outpatients and dealing with misperceptions related to management of "radiation" victims.*
University of Mississippi Medical Center	*A challenge that I see in today's webinar is how is the hospital actually going to react when an incident occurs. We have key players in the webinar but I think education is lacking across the board.*
University of North Carolina Hospitals	*Financial issues related to patient and donor management would be a huge issue. Based on scenario, predicting the radiation exposure would be difficult.*
University of Pennsylvania Medical Center	*- The sheer volume of patients would be a concern. This exercise did not create much strain on the current operations, but a larger volume of patients would be challenging. - The potential for pediatric patients to be routed to our center. We have a children's hospital down the street so would have to work closely with them to ensure age-appropriate care.*
Western Pennsylvania Cancer Institute	*Even though we participate in drills, we will not know how an actual event will impact our center. This drill does help identify strengths and weakness and needs for changes in the SOP at our center.*

List and briefly discuss elements to address for future RITN exercises.	
Banner – University Medical Center	*Provide more Clinically & detailed based drills. Invite other key partners: State and County Public Health, University RSO, MMRS people, Reception Center leaders, various other community partners.*

List and briefly discuss elements to address for future RITN exercises.	
Cleveland Clinic Foundation	*No response provided.*
Massachusetts General Hospital	*1. Funding sources. 2. How to deal with mass casualties involving a much larger number of victims It would be helpful to work through a larger scale triage of patients, and to involve state and national level emergency response teams that would facilitate the exercise.*
Mount Sinai Hospital	*Housing and support of outpatients and families. Integration with the National Response Framework and coordination with FEMA and HHS during a Stafford Act declared disaster.*
Strong Memorial Hospital	*Billing mechanisms.*
University of California San Francisco Medical Center	*It would be helpful to have a toolbox of resources for screening patients that is easy to access and user-friendly in a crisis, and to practice using the tool in a future RITN exercise.*
University of Colorado Hospital	*Incorporate more of the NDMS/FCC reception process into the scenario. Incorporate patient discharge and repatriation issues into the scenario. Incorporate special needs population into the scenario.*
University of Mississippi Medical Center	*This was by far the best exercise. I think that some RITN centers are not utilizing the tools that are provided online. This may need to be addressed in an email or during a conference call prior to the exercise to make sure everyone is on the same page.*
University of North Carolina Hospitals	*The financial piece is a big issue for all centers!*
University of Pennsylvania Medical Center	*- Larger volume of patients - Victims of an IND or dirty bomb as the risk of contamination and appropriate safety measures with those victims is a scenario worth practicing and discussing.*
Western Pennsylvania Cancer Institute	*No response provided.*

APPENDIX E: ACRONYMS

Acronym	Term
AAR	After Action Report
ASPR	Assistant Secretary for Preparedness and Response
BMT	Bone Marrow Transplantation
EEG	Exercise Evaluation Guide
FCC	Federal Coordinating Center
GCSF	Granulocyte Colony-Stimulating Factor
HCS	Healthcare Standard
HEPA	High-Efficiency Particulate Absorption
HHS	Health and Human Services
HLA	Human Leukocyte Antigen
HPP	Hospital Preparedness Program
NMDP	National Marrow Donor Program
NDMS	National Disaster Medical System
RED	Radiological Exposure Device
RITN	Radiation Injury Treatment Network
SITREP	Situation Report
SME	Subject Matter Expert
TTX	Tabletop Exercise