2015

After-Action Report/Improvement Plan

EXERCISE OVERVIEW

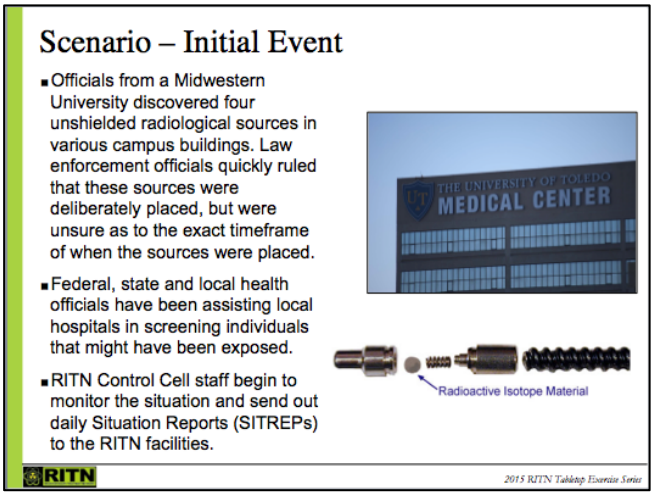
Exercise Name	2015 RITN Tabletop Exercise (TTX)
Exercise Date	June 9, 2015
Scope	This exercise is a distance-based tabletop exercise planned for 2 ½ hours. Exercise play is limited to RITN facilities and their response partners' collective challenges and considerations for improved and effective response
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	114 South Dakota Air National Guard American Red Cross Avera McKennan Transplant Institute – Sioux Falls, SD Children's Mercy Hospital – Kansas City, MO

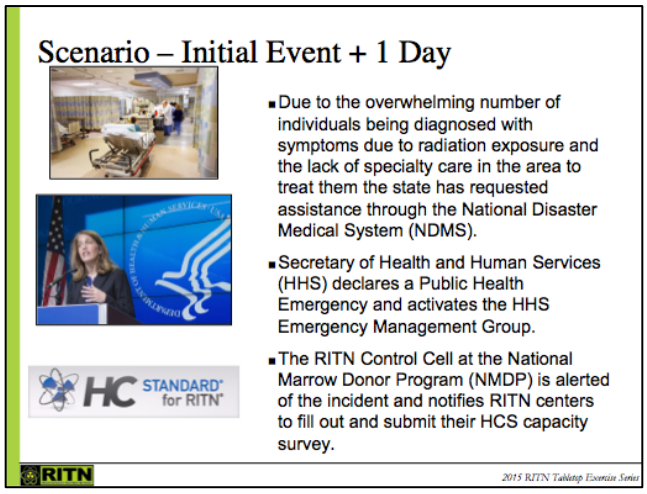
	Huntsman Hospital – Salt Lake City, UT LDS Hospital/PCMC/University of Utah – Salt Lake City, UT Michigan Department of Health and Human Services Mount Sinai Hospital – New York, NY Northwestern University – Chicago, IL NYU Langone Medical Center – New York, NY Primary Children's Hospital – Salt Lake City, UT Sioux Falls Health Department – Sioux Falls, SD Ronald McDonald House The Karmanos Cancer Center – Detroit, MI University of Kansas Hospitals – Lawrence, KS University of Texas MD Anderson Cancer Center – Houston, TX Wake Forest Baptist Medical Center – Winston-Salem, NC Westchester Medical Center – Valhalla, NY West Virginia University Hospital – Morgantown, WV RITN Control Center – Minneapolis, MN
Point of Contact	RITN Control Cell RITN@NMDP.ORG (612) 884-8276

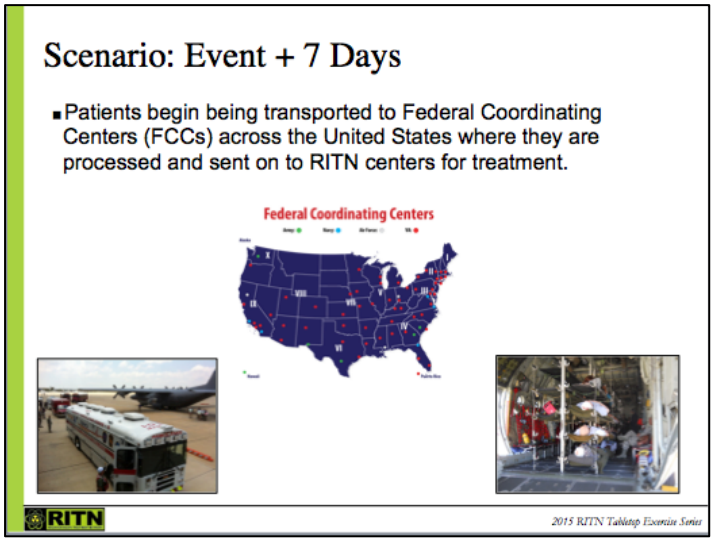
EXERCISE SUMMARY

On June 9, 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:





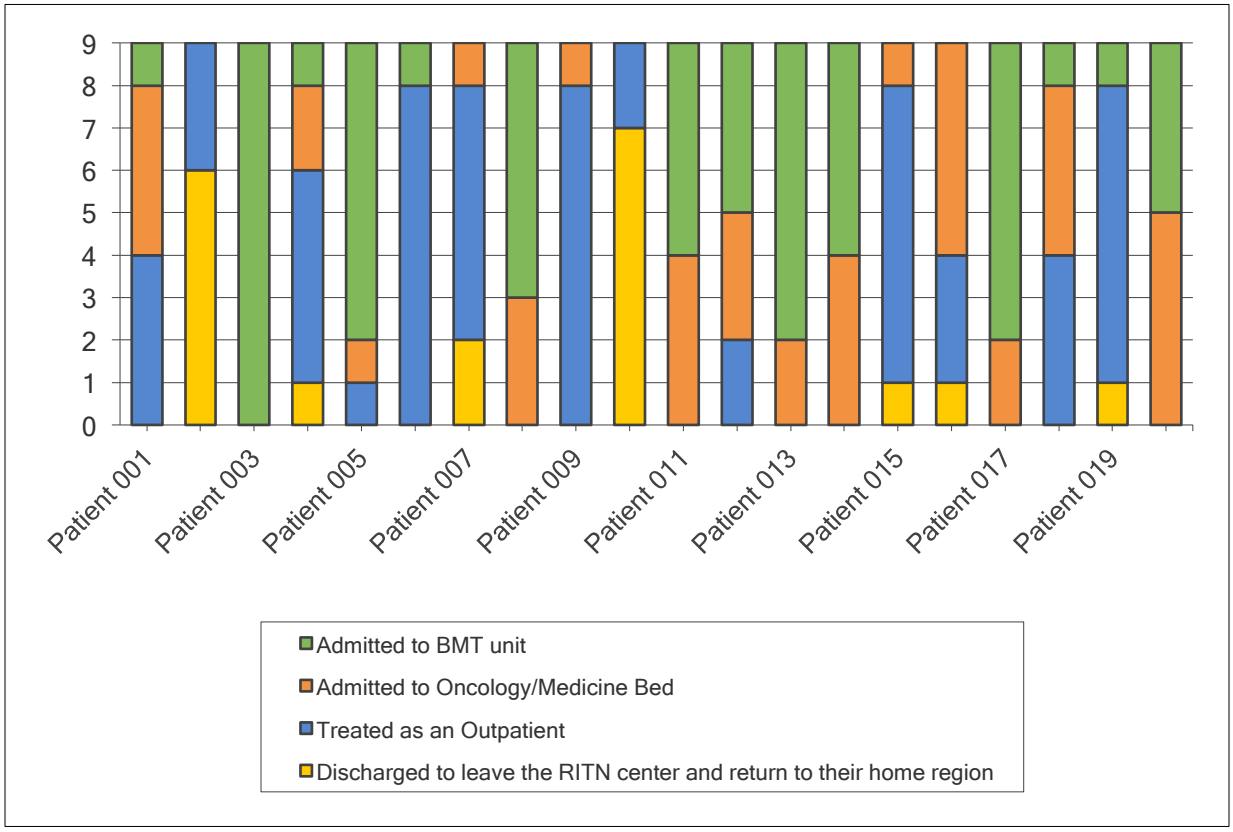


ANALYSIS OF CAPABILITIES

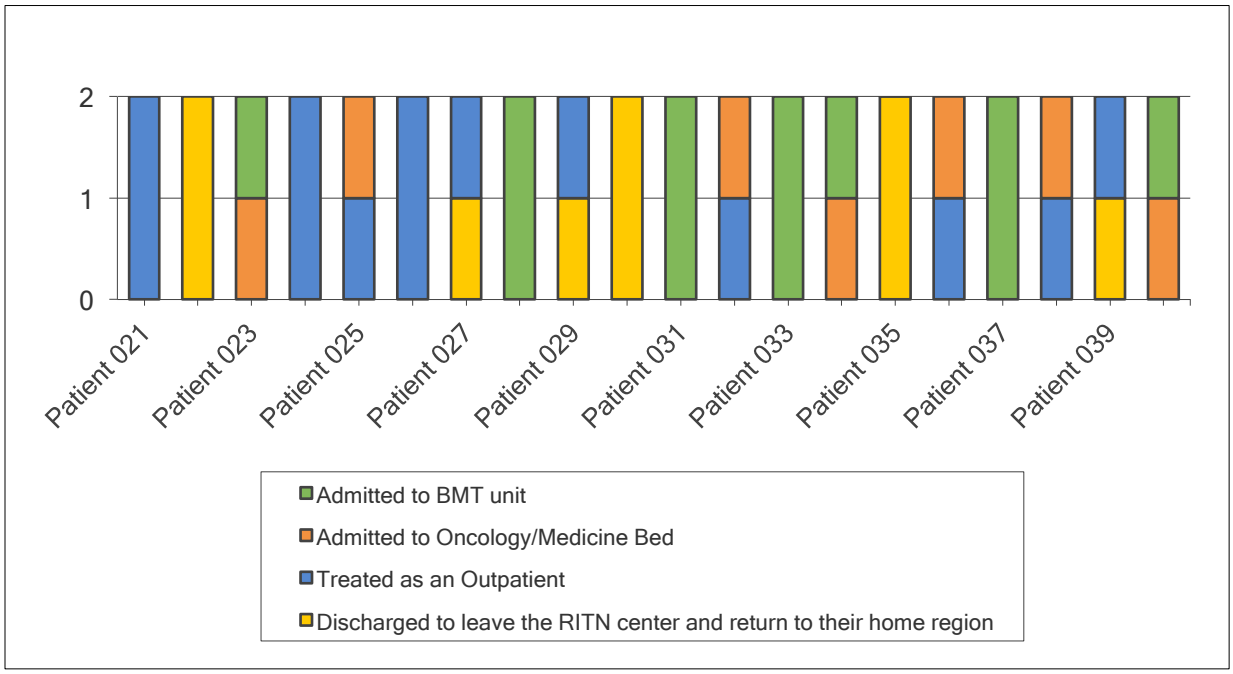
Question Block 1: Triage and Treatment of Patients

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 (although the pediatric patients would be transported to the local Children's Hospital) (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 (11 centers)



Pediatric Patient Triage Outcomes (2 centers)



A consensus was not reached regarding the definition of "home region" therefore; the RITN centers differed in their triage and treatment of the adult and pediatric patients. 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.

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 at the RITN centers or at off-site clinics. If the volume of blood draws exceeds their capacity, hospital units, such as the Hematology/Oncology Unit would provide support in order to meet the increased demand. 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. Additionally, many centers indicated facility-owned houses would be made available. The Ronald McDonald House was discussed as an option though limited space to accommodate the outpatient numbers and families would likely exceed the Ronald McDonald House's capacity on most days. 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. 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 are as follows:

RITN Center (11 Centers)	Quantity
Avera McKennan Transplant Institute	Enough to treat 50 patients with 10mcg/kg dosing
The Children's Mercy Hospital	16,200 mcg
The Karmanos Cancer Center	< 500 units
LDS Hospital	17.8 mg
University of Texas M.D. Anderson Cancer Center	600 units
Mt. Sinai Hospital	77 mg
Primary Children's Hospital	7.7 mg
University of Utah	63 units
Wake Forest Baptist Medical Center	45,840 mcg
Westchester Medical Center	307,680 mcg
West Virginia University Hospital	100 vials of G-CSF on hand, 50 300mcg vials and 50 480 vials

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 8 mg or less in their usage. Instead, an increase in demand would be noted and monitored, but all centers stated adequate management for a 20 patient increase. Centers also indicated MOUs in place with local hospitals for re-supply.

Vial Splitting: With exception of one participating center, all routinely reduce G-CSF waste by splitting vials. Doses are split under a laminar hood, which is anticipated to continue during a surge event. The one center that does not routinely split vials has a plan to do so.

Pharmaceuticals: For 20 additional patients, approximately half of the facilities reported as being in short supply of anti-bacterial (e.g. levofloxacin), Anti-fungal (e.g. fluconazole), Anti-HSV (e.g. acyclovir), and Anti-PCP (e.g. Bactrim). If supplies became low, re-supply would be coordinated through facilities within the health network, current healthcare coalitions, local university hospitals and healthcare systems. Once those resources were depleted, many facilities indicated initiating resource requests to their state health department.

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.

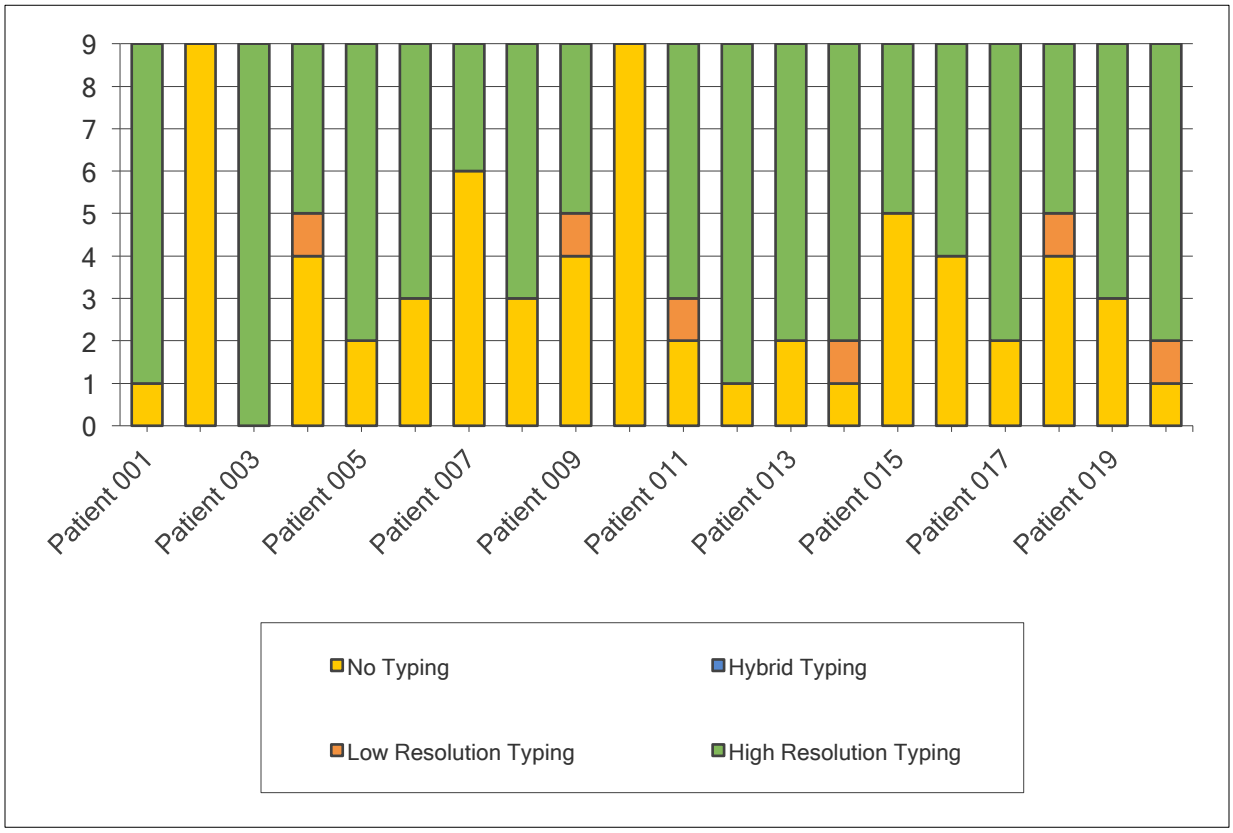
Areas for Improvement

The following areas require improvement:

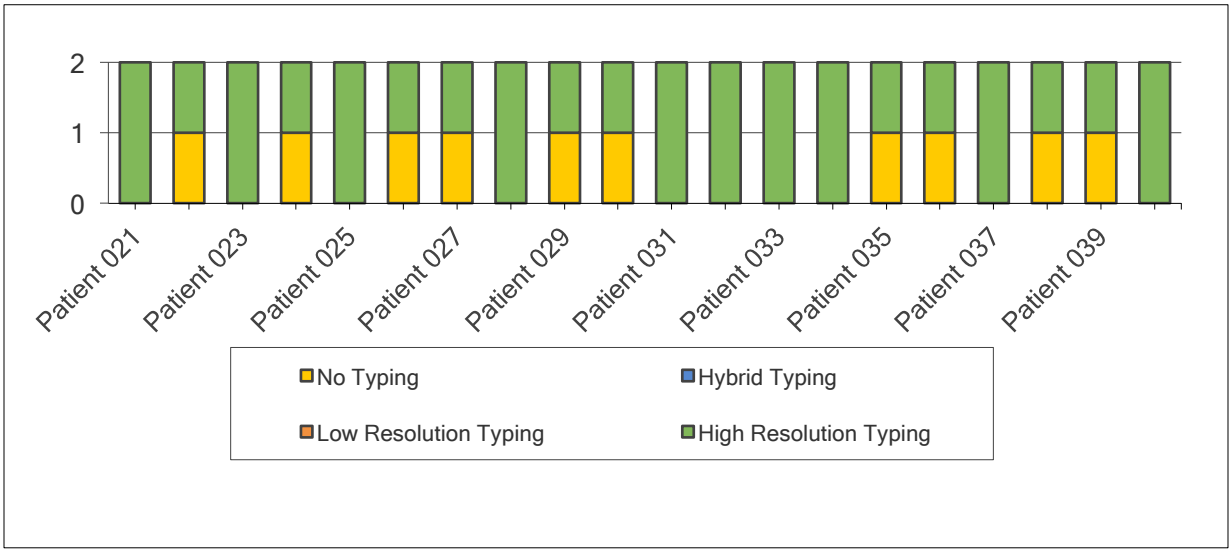
Area for Improvement 1: RITN centers should address any medium and long-term housing issues that outpatient and their families from outside the region may face if the only housing alternative is local hotels. None of the centers discussed plans to address medium and long-term housing issues for these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

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 hospitals (Children's Mercy Hospital and



Primary Children's Hospital) for the 20 pediatric patients triaged and treated.

One center raised the financial cost incurred as a consideration to monitor/record especially if High Resolution Typing is determined. Centers did not discuss financial costs further.

Sample Retrieval: Centers all preferred blood draws for sample retrieval for HLA typing though buccal swabs would be used if blood draws were not possible.

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

Timing of Results: Class 1 low resolution typing and Class 2 high resolution is 3 – 5 days turnaround for results reporting with an additional day to complete all high resolution typing. 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, which would extend the reporting results by 1 – 2 days.

Surge: All RITN centers would rely on the NMDP if sibling typing were needed for more than 100 samples.

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.

Strengths

The following strengths demonstrated:

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

Areas for Improvement

The following areas require improvement:

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

Area for Improvement 2: As part of continued response planning, determine the level of support community non-profit organizations, such as the Ronald McDonald House, can provide regarding family housing support. Planning components to address may include staffing needs,

resource levels and re-supply alternatives, costs (if any back to the hospital) or donation structures, legal parameters, and terms and conditions of the organization.

Area for Improvement 3: As part of the improvement planning process, RITN centers should review procedures to track/record costs if the NDMS victims are transported to their centers for medical treatment and management. Include HLA Typing costs as part of the financials that would be tracked/recorded.

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	Avera Mckennan Transplant Institute	Karmanos Cancer Center	LDS Hospital	Univ of Texas MD Anderson Cancer Center	Mt. Sinai Hospital	Univ of Utah	Wake Forest Baptist Medical Center	Westchester Medical Center	WVU Hospital
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	Admitted to BMT unit	Admitted to Oncology/Medicine Bed	Admitted to Oncology/ Medicine Bed	Treated as an outpatient	Treated as an Outpatient	Admitted to Oncology/Medicine Bed	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	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	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	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	Treated as an Outpatient	Discharged 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 BMT unit	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 BMT unit	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 BMT unit	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	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**	Admitted to Oncology/Medicine Bed	Treated as an Outpatient	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 BMT unit

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arrival at your center: *all results are represented as ×10⁹ C/L* Platelets: 10 Granulocytes: 0.1 Lymphocytes: 0.01									
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 BMT unit	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: 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	Discharged to leave the RITN center and return to their home region	Treated as an Outpatient	Treated as an Outpatient	Discharged to leave the RITN center and return to their home region	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed
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 BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed
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	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
Patient ID: 010 Sex: Male Age: 20 Height: 6'4" Weight: 195lbs Comorbidities/Symptoms: Crohn's disease **Lab results upon arrival at your**	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	Discharged to leave the RITN center and return to their home region	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

Adult Patient Clinical Profile	Avera Mckennan Transplant Institute	Karmanos Cancer Center	LDS Hospital	Univ of Texas MD Anderson Cancer Center	Mt. Sinai Hospital	Univ of Utah	Wake Forest Baptist Medical Center	Westchester Medical Center	WVU Hospital
center: *all results are represented as ×10⁹ C/L* Platelets: 190 Granulocytes: 7 Lymphocytes: 2.10									
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 Oncology/Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed
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 BMT unit	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed
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 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 BMT unit	Admitted to BMT unit	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	Admitted to Oncology/Medicine Bed	Admitted to BMT unit	Admitted to Oncology/Medicine Bed	Admitted to BMT unit	Admitted to Oncology/Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to BMT unit
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*	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	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient

Adult Patient Clinical Profile	Avera Mckennan Transplant Institute	Karmanos Cancer Center	LDS Hospital	Univ of Texas MD Anderson Cancer Center	Mt. Sinai Hospital	Univ of Utah	Wake Forest Baptist Medical Center	Westchester Medical Center	WVU Hospital
represented as ×10⁹ C/L Platelets: 110 Granulocytes: 1.5 Lymphocytes: 1									
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	Discharged to leave the RITN center and return to their home region	Admitted to Oncology/Medicine Bed	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/Medicine Bed	Admitted to Oncology/ Medicine Bed	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 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 BMT unit	Admitted to BMT unit	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	Treated as an Outpatient	Admitted to Oncology/Medicine Bed	Treated as an Outpatient	Admitted to Oncology/Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	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	Admitted to BMT unit	Treated as an Outpatient	Discharged 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	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**	Admitted to BMT unit	Admitted to Oncology/Medicine Bed	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 BMT unit	Admitted to Oncology/ Medicine Bed

Adult Patient Clinical Profile	Avera Mckennan Transplant Institute	Karmanos Cancer Center	LDS Hospital	Univ of Texas MD Anderson Cancer Center	Mt. Sinai Hospital	Univ of Utah	Wake Forest Baptist Medical Center	Westchester Medical Center	WVU Hospital
center: *all results are represented as $\times 10^9$ C/L* Platelets: 60 Granulocytes: 0.3 Lymphocytes: 0.2									

Pediatric Patients

Pediatric Patient Clinical Profile	The Children's Mercy Hospital	Primary Children's Hospital
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**	Treated as an Outpatient	Treated as an Outpatient
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	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 Oncology/Medicine Bed	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	Treated as an Outpatient	Treated as an Outpatient
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	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 represented as ×10⁹ C/L* Platelets: 70 Granulocytes: 1.2 Lymphocytes: 0.3	Treated as an Outpatient	Treated as an Outpatient
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	Discharged to leave the RITN center and return to their home region
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	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	Discharged to leave the RITN center and return to their home region
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	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	Admitted to BMT unit
Patient ID: 032 Sex: Female Age: 8 Height: 4'2" Weight: 110lbs Comorbidities/Symptoms: Morbid obesity	Treated as an Outpatient	Admitted to Oncology/Medicine Bed

Pediatric Patient Clinical Profile	The Children's Mercy Hospital	Primary Children's Hospital
Lab results upon arrival at your center: *all results are represented as ×10⁹ C/L* Platelets: 60 Granulocytes: 0.4 Lymphocytes: 0.2		
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	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	Admitted to BMT unit
Patient ID: 035 Sex: Male Age: 10 Height: 4'5" Weight: 65lbs 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	Discharged to leave the RITN center and return to their home region	Discharged to leave the RITN center and return to their home region
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	Treated as an Outpatient	Admitted to Oncology/Medicine Bed
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	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	Admitted to Oncology/Medicine Bed	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	Treated as an Outpatient	Discharged to leave the RITN center and return to their home region
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	Admitted to BMT unit

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 9, 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	Avera Mckennan Transplant Institute	Children's Mercy Hospital	Karmanos Cancer Institute	LDS Hospital	Univ of Texas MD Anderson Cancer Center	Mt. Sinai Hospital	Primary Children's Hospital	Univ of Utah	Wake Forest Baptist Medical Center	Westchester Medical Center	WVU Hospital
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	✔		✔						✔		

Position	Avera Mckennan Transplant Institute	Children's Mercy Hospital	Karmanos Cancer Institute	LDS Hospital	Univ of Texas MD Anderson Cancer Center	Mt. Sinai Hospital	Primary Children's Hospital	Univ of Utah	Wake Forest Baptist Medical Center	Westchester Medical Center	WVU Hospital
Poison control center rep											
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 4.84 (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.	
Avera McKennan Hospital & University Health Center	*We have a strong community partnership with the city, county, state, SD ANG, health care coalition, etc). We also have the availability to surge bed capacity when needed*
Children's Mercy Hospital	*Our physician was very well versed on the patients and was able to share RITN resources that he used in making his decisions regarding clinical care. We had a great cross section of hospital staff and community representation attending and contributing.*
Karmanos Cancer Center	*Well prepared accompanied with our ability and willingness to utilize the following methodologies and resources: RITN Concept of Operations, ARS Guidlelines, the dosage calculator. Great collaboration with the cross functional teams and our State of Michigan coalition; inclduing the representative from the SNS coordinating center. The State of Michigan has a robust preparedness plan. The RITN is well respected by the Region 2 South Emergency Preparedness coalition.*
LDS Hospital	*The three centers in Utah - LDSH, PCMC and the Univ of Utah, - continue to meet together for these drills. I believe this will help us collaborate in the event of an incident.*
Mt. Sinai Hospital	*The hospital's flexibility and being able to respond to an event like this. The also demonstrating how internal coordination allowed us to expand and receive this type of surge patients.*
Northwestern Memorial Hospital	*No response provided*

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.	
NYU Langone Medical Center	*No response provided*
Primary Children's Hospital	*Our hospital had all the needed pharmaceuticals for the patients in the scenario.*
University of Texas MD Anderson Cancer Center	*Due to our institution's size and the expertise we have in dealing with these types of patients we have found that we are fairly well-equipped for an emergency.*
University of Utah	*I believe that Salt Lake City has a great advantage to do succeed in our RITN efforts because we are always taking a cooperative approach as 3 collective RITN centers.*
Wake Forest Baptist Medical Center	*Satellite locations for blood draws Ability to quickly type HLA internally*
Westchester Medical Center	*Diverse team effort addressing topic that is relatively new to several. Better understanding of required resources for such an event*
West Virginia University Hospital	*We feel we have a system in place to house patients and families. We have a Family House and agreements with local hotels. We also have utilized Camp Dawson in the past a large number of patients for the response to Katrina. Due to past drug shortages, we already have a system in place to borrow drugs from regional hospitals and retail. Our supplies can have drug here in 24 to 48 hours.*

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.

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.	
Avera McKennan Hospital & University Health Center	*Housing for outpatient victims/families in the immediate timeframe could pose to be a challenge*
Children's Mercy Hospital	*Staff education - the right information at the right time. We found we need to invite Midwest Transplant Network to be a part of this as well.*
Karmanos Cancer Center	*Standardization of which victims would be transplanted and which recipeints would be HLA typed across the continuum of Transplant Centers. It was noted that disparity existed between the Transplant Centers even when the radiation exposure exceeded the advised limits for stem cell transplantation. The group did ask that I comment regarding the audio disruptions. Multiple sites experienced this multiple times and it did frustrate our team, particularly the physicians. Also, the code that was providied via the screen was not correct when attempting to re-connect. We do understand this was a logistically based issue but it disrupted the flow and we were disappointed that we were not able to share our level of engagement and expertise with the other sites.*
LDS Hospital	*We would like to review what resources NMDP will be giving in the event of an incident.*
Mt. Sinai Hospital	*It would have been good to have a clearer picture of NMDP's role and what kind of support they would be able to provide for these types of incidents. Knowing how they would assist the hospital's would be more helpful in terms of planning.*
Northwestern Memorial Hospital	*No response provided*
NYU Langone Medical Center	*No response provided*

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.	
Primary Children's Hospital	*Potential housing coordination issues for patient families being brought into the area (3 RITN hospitals within 5 mile radius).*
University of Texas MD Anderson Cancer Center	*Bed availability is an issue for us.*
University of Utah	*I believe we need clarification regarding the resources that could potentially be provided via RITN/NMDP.*
Wake Forest Baptist Medical Center	*Family care for vicitims How to support the extra number of transplants post discharge*
Westchester Medical Center	*Need to expand team membership Work on streamlined protocols*
West Virginia University Hospital	*We workup and collect sibling donors here at WVUH. This means that the sibling must travel and stay in Morgantown. If this would not be possible for the donors or if the number of donors to be collected would over whelm our capabilities, it would be beneficial to have a system in place to facilitate the workup, clearance, and collections at a facility close to the donor's home much like we do for our unrelated donors.*

List and briefly discuss elements to address for future RITN exercises.	
Avera McKennan Hospital & University Health Center	*We logged in 30 minutes ahead of time of the webinar as requested. However when the webinar started we experienced techinical difficulties with the sound that required us to close down, and restart the webinar. It would be nice to have an audio test or sound check 10 minutes or so prior to the log in stating as such "the exercise will be starting shortly, please let us know if you are having audio/visual issues". It seemed like we were*

List and briefly discuss elements to address for future RITN exercises.	
	not the only site with this issue We were unaware that the exercise scenarios rotated every 3 years, and thus while the clinical information was a great asset, it kind of left out our community partners who were in attendance. Would it be possible to cut down on the timeframe of discussion and/or number of sites responding in an effort to encompass more of a whole picture of the event? It was very helpful having the dose calculator available ahead of time. It allowed us to calculate the doses prior to the exercise and gave us more time to discuss triage based on dose received and comorbidities. It seemed like this was not the case for a majority of the other centers. I am not sure if they were unaware of the calculator before hand or if they would truly transplant everyone? Regardless, we found a lot of benefit of the calculator and will be adding a reference to it in our policy. We appreciate the webinar venue for this event. Great session!
Children's Mercy Hospital	*Maybe have a part 2 of the TTX where we look at 2 weeks post activation. Pick approximately 5 patients from the list and follow them from beginning to end (similar to a case study).*
Karmanos Cancer Center	*Advanced and structured care plans and algorithms specific to triage for transplantation and HLA typing.*
LDS Hospital	*No response provided*
Mt. Sinai Hospital	*It would have been good to have a clearer picture of NMDP's role and what kind of support they would be able to provide for these types of incidents. Knowing how they would assist the hospitals would be more helpful in terms of planning.*
Northwestern Memorial Hospital	*No response provided*
NYU Langone Medical Center	*No response provided*

List and briefly discuss elements to address for future RITN exercises.	
Primary Children's Hospital	*Creating scenarios that are built for bordering states to give a more realistic timeline for patient arrival*
University of Texas MD Anderson Cancer Center	*A more interactive exercise that is more like a real scenario instead of just going over the questions*
University of Utah	*I think we should always assess the clinical aspect of such scenario, as we did today. Provider/physician involvement is crucial to our success in best planning efforts. Thanks!*
Wake Forest Baptist Medical Center	*Resources for post incident care*
Westchester Medical Center	*Please include discussion of RITN assets and capabilities*
West Virginia University Hospital	*20 patients would not tax our current system. It would be helpful to practice with a larger patient surge.*

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
MOU	Memoranda of Understanding
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