2015

After-Action Report/Improvement Plan

EXERCISE OVERVIEW

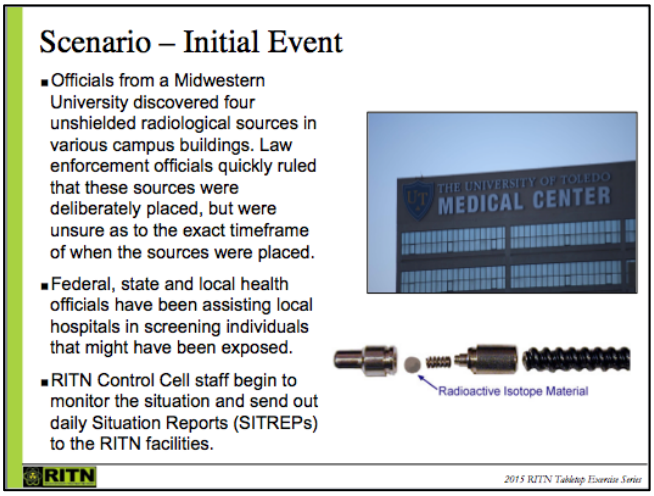
Exercise Name	2015 RITN Tabletop Exercise (TTX)
Exercise Date	July 22, 2015
Scope	This exercise is a distance-based tabletop exercise planned for 2 ½ hours. Exercise play is limited to RITN facilities and their response partners' collective challenges and considerations for improved and effective response
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	All Children's Hospital – St. Petersburg, FL Barnes-Jewish Hospital – St. Louis, MO City of Hope Medical Center – Duarte, CA Froedtert Hospital and the Medical College of WI – Milwaukee, WI

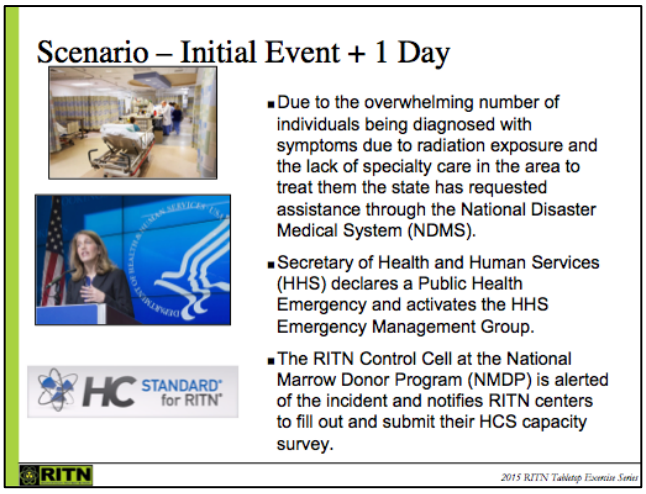
	Presbyterian/St. Luke's Medical Center – Denver, CO Rosewell Cancer Institute – Buffalo, NY Rush University Medical Center – Chicago, IL Scripps Green Hospital – La Jolla, CA The Children's Hospital of Pennsylvania – Philadelphia, PA University of Alabama at Birmingham – Birmingham, AL University of Iowa Hospitals and Clinics – Iowa City, IA University of Pennsylvania Medical Center – Philadelphia, PA
Point of Contact	RITN Control Cell RITN@NMDP.ORG (612) 884-8276

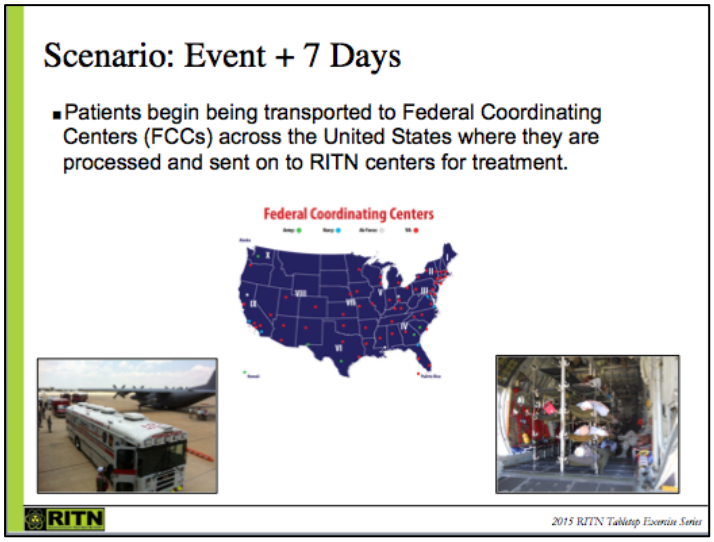
EXERCISE SUMMARY

On July 22, 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:





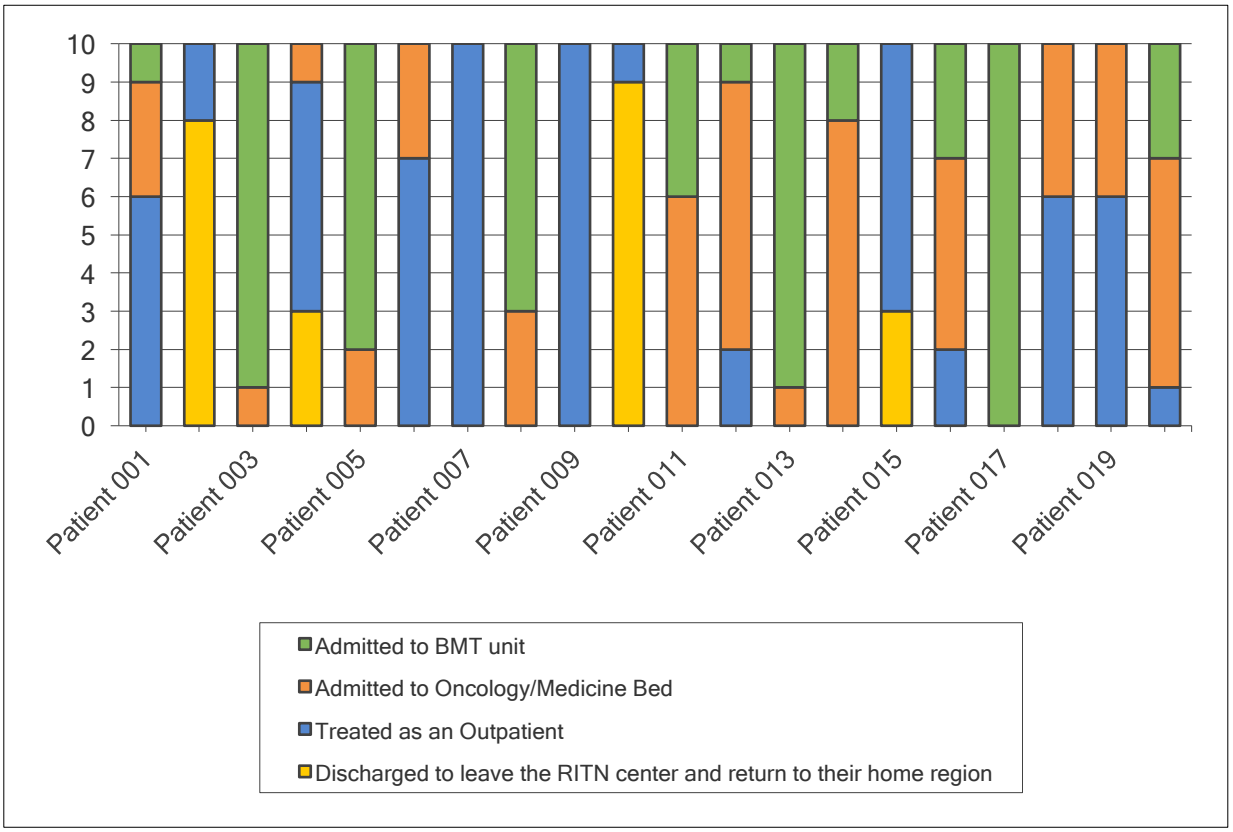


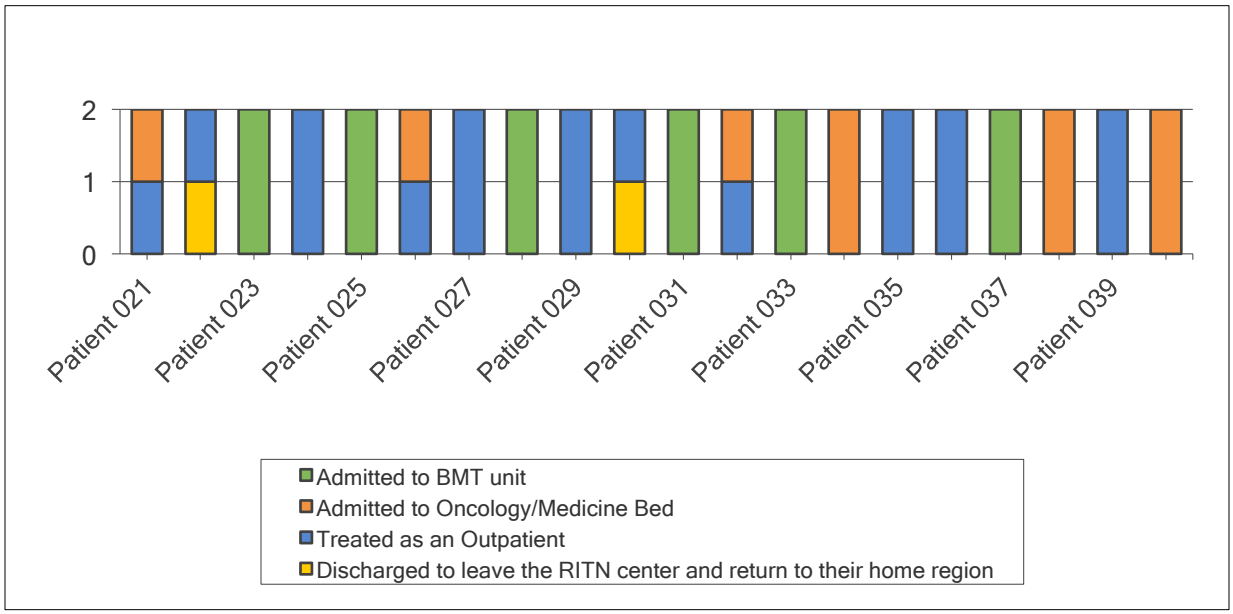
ANALYSIS OF CAPABILITIES

Question Block 1: Triage and Treatment of Patients

Triage and Treatment: The participating RITN centers demonstrated resourced transplant programs to triage and treat adult and pediatric patients (Appendix A). At the command level, centers created patient cohorts to conserve resources and only those patients developing complications would be admitted. Comorbidities as well as patient caregiver competency were two considerations discussed in the overall medical management process.

Adult Patient Triage Outcomes (7 centers)





Social services would coordinate medical care for those sent back to their home region for 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 demonstrated significant transplant resources to successfully triage and treat all patients that would present at their facility.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: 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 inpatient unit floor or at cancer center laboratory. 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, BMT social workers, campus (or facility) security, and local authorities along with existing partnerships with community organizations as the first step to address housing issues such as the American Red Cross, Hope Lodge, and the Ronald McDonald House. All centers suggested use of their on-campus townhouses and 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-CSF. Specific amounts for those that responded are as follows:

RITN Center	Quantity
All Children's Hospital	14 mg
Barnes – Jewish Hospital	317,280 mcg
Children's Hospital of Philadelphia	9.5 doses
City of Hope National Medical Center	72 mg
Froedtert Memorial Hospital	46,2000 mcg
Presbyterian / St. Luke's Medical Center	100 mg
Rush University Medical Center	37 mg
Scripps Green Hospital	7,500 mcg
University of Alabama – Birmingham	16,805 mcg
University of Pennsylvania Medical Center	48,000 mcg

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 13 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 and would rely on neighboring hospitals and clinics as well as healthcare coalition hospitals for support.

Vial Splitting: Most centers indicated not splitting vials as part of normal protocols, 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 any of the participating centers; although one center reported a shortage risk of levofloxacin with the additional 20 patient surge. Additionally, centers noted the national shortage of IV antibiotics, which may result in a risk depending on the number of patients that worsen or require transplant. If supplies became low, requests for re-supply would be coordinated through vendors as well as existing healthcare coalitions, local and regional transplant community networks, local university hospitals and healthcare systems.

The RITN Control Center can forward information such as shortages directly to HHS to alert the program nationally of shortages experienced at RITN centers. The RITN Control Center is not able to impact/redirect federal caches or supplies (e.g. redirect the Strategic National Stockpile shipments) or from vendor-managed inventories (such as AmGen) committed to the federal government.

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:

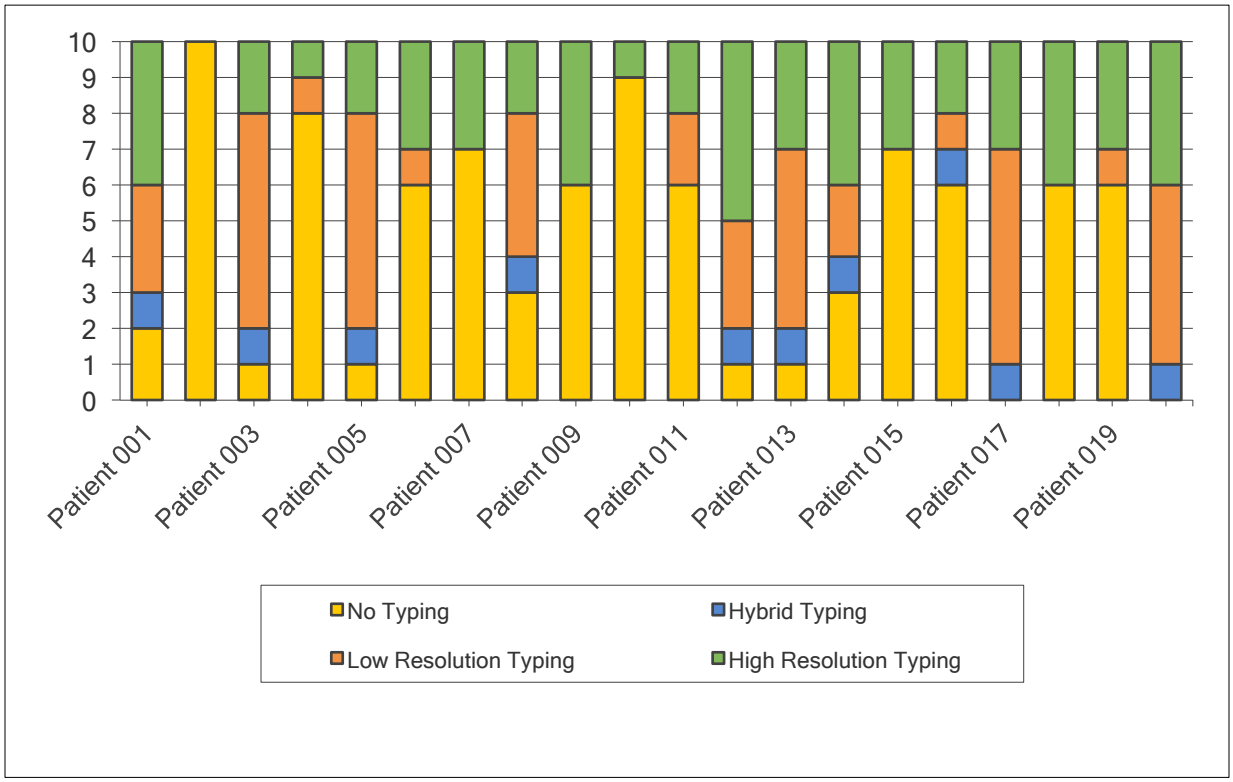
Area for Improvement 1: RITN centers should address any medium and long-term housing issues that outpatient and their families from outside the region may face if the only housing alternative is local hotels. None of the centers discussed plans to address medium and long-term housing issues for these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

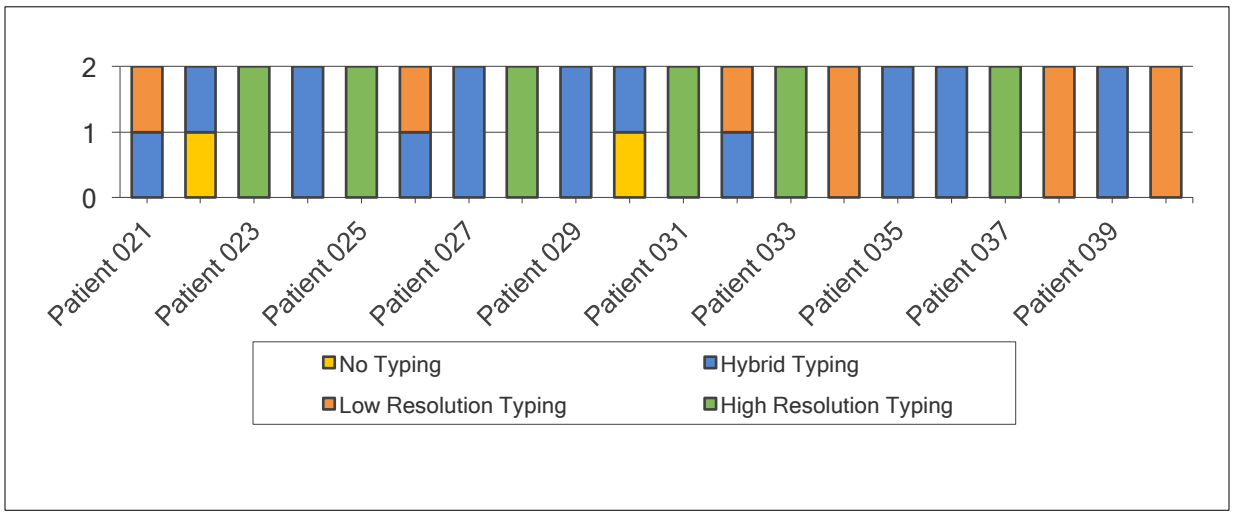
Area for Improvement 3: RITN centers should initiate planning efforts to address the regional vendor codependency for resources to medically treat and manage a second wave of patients. Though all centers discussed and demonstrated multiple channels for resupply at their local and regional levels for the first wave of victims, several centers indicated a second wave of victims could result in supply shortage risks.

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 (All Children's Hospital and Children's Hospital of Philadelphia) 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: A majority of the 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 was reported to range from 1 to 2 days for results reporting and high resolution typing results would be available within 2 to 3 days. On average, if samples are sent to an external laboratory, the turnaround time for results is an average of 3 to 5 days, though two centers indicated 7 days for results retrieval.

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: RITN centers would rely on the NMDP if sibling typing were needed for more than 100 samples. Services requested from NMDP would be for blood collection and laboratory services.

Donor Assistance: Any donor assistance needed would be coordinated with NMDP. Generally, centers would heavily rely on NMDP for the following:

- Blood collection
- Laboratory services (HLA typing)
- Locating sibling donors
- Physical exams
- Workups (such as consent forms, interviews).

Strengths

The following strengths demonstrated:

Strength 1: RITN centers demonstrated the resources as well as the coordination (in-house and external partners) to medically manage the first wave of victims including those requiring transplantation.

Areas for Improvement

The following areas require improvement:

Area for Improvement 1: RITN Program and NMDP should continue collaboration planning efforts to adjudicate and prioritize the donor assistance requested from all RITN centers based on the scenario information in this exercise.

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	Barnes-Jewish Hospital	City of Hope Medical Center	Froedtert Hospital / Med College of WI	Presbyterian / St. Luke's	RUMC	Scripps Green Hospital	Univ. of AL - Birmingham	Univ. of PA Medical Center
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	Admitted to Oncology / Medicine Bed	Admitted to BMT unit	Admitted to Oncology / Medicine Bed
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	Discharge to leave the RITN center and return to their home region	Discharged to leave the RITN center and return to their home region	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	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 BMT unit	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
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	Treated as an Outpatient	Discharge to leave the RITN center and return to their home region	Treated as an Outpatient	Admitted to Oncology / Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Treated as an Outpatient	Discharge to leave the RITN center and return to their home region

Adult Patient Clinical Profile	Barnes-Jewish Hospital	City of Hope Medical Center	Froedtert Hospital / Med College of WI	Presbyterian / St. Luke's	RUMC	Scripps Green Hospital	Univ. of AL - Birmingham	Univ. of PA Medical Center
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 Oncology / Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	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	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	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	Admitted to Oncology / Medicine Bed	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 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

Adult Patient Clinical Profile	Barnes-Jewish Hospital	City of Hope Medical Center	Froedtert Hospital / Med College of WI	Presbyterian / St. Luke's	RUMC	Scripps Green Hospital	Univ. of AL - Birmingham	Univ. of PA Medical Center
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
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	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	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
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 Oncology / Medicine Bed	Admitted to BMT unit	Admitted to BMT unit	Admitted to BMT unit	Admitted to Oncology / Medicine Bed	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 Oncology / Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology / Medicine Bed	Admitted to BMT unit	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit	Admitted to Oncology / Medicine Bed

Adult Patient Clinical Profile	Barnes-Jewish Hospital	City of Hope Medical Center	Froedtert Hospital / Med College of WI	Presbyterian / St. Luke's	RUMC	Scripps Green Hospital	Univ. of AL - Birmingham	Univ. of PA Medical Center
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 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: 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 Oncology/ Medicine Bed	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 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	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	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	Admitted to BMT unit	Admitted to Oncology / Medicine Bed	Admitted to Oncology / Medicine Bed	Admitted to BMT unit	Admitted to Oncology / Medicine Bed	Admitted to Oncology / Medicine Bed	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 BMT unit	Admitted to BMT unit	Admitted to BMT unit

Adult Patient Clinical Profile	Barnes-Jewish Hospital	City of Hope Medical Center	Froedtert Hospital / Med College of WI	Presbyterian / St. Luke's	RUMC	Scripps Green Hospital	Univ. of AL - Birmingham	Univ. of PA Medical Center
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	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Admitted to Oncology/ Medicine Bed	Treated as an Outpatient	Treated as an Outpatient	Admitted to BMT unit	Treated as an Outpatient
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	Admitted to Oncology / Medicine Bed	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
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 Oncology / Medicine Bed	Admitted to Oncology/ Medicine Bed	Admitted to Oncology / Medicine Bed	Admitted to BMT unit	Treated as an Outpatient	Admitted to BMT unit	Admitted to Oncology/ Medicine Bed	Admitted to BMT unit

Pediatric Patients

Pediatric Patient Clinical Profile	All Children's Hospital	Children's Hospital of Philadelphia
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	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*	Treated as an Outpatient	Discharged to leave the RITN center and return to their home region

Pediatric Patient Clinical Profile	All Children's Hospital	Children's Hospital of Philadelphia
Platelets: 280 Granulocytes: 5 Lymphocytes: 2.00		
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	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	Admitted to Oncology / Medicine Bed	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	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	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	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	Treated as an Outpatient	Discharged to leave the RITN center and return to their home region
Patient ID: 031	Admitted to BMT	Admitted to BMT unit

Pediatric Patient Clinical Profile	All Children's Hospital	Children's Hospital of Philadelphia
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	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	Treated as an Outpatient
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 Oncology/Medicine Bed
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	Treated as an Outpatient	Treated as an Outpatient
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	Treated as an Outpatient
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	Admitted to Oncology/Medicine Bed
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*	Treated as an Outpatient	Treated as an Outpatient

Pediatric Patient Clinical Profile	All Children's Hospital	Children's Hospital of Philadelphia
Platelets: 135 Granulocytes: 1 Lymphocytes: 0.25		
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 $\times 10^9$ C/L* Platelets: 60 Granulocytes: 0.3 Lymphocytes: 0.2	Admitted to Oncology/Medicine Bed	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 July 22, 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	All Children's Hospital	Barnes-Jewish Hospital	Children's Hospital of Philadelphia	City of Hope Medical Center	Froedtert Hospital / Med College of WI	Presbyterian / St. Luke's	RUMC	Scripps Green Hospital	Univ. of PA Medical Center
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									
Healthcare coalition rep							✔		
HLA Lab Rep		✔			✔				

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 4.88 (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.	
All Children's Hospital	*Great turn out of medical and supportive staff, played out scenario well with great discussion. Identified a few challenges that we could potentially face and improvement opportunities.*
Barnes-Jewish Hospital	*Due to the size of the institution and program, we should be able to handle the patient volume. We have a multitude of oncology/BMT units that can accommodate these patients. Our stockpile of medications will also allow us to care for these patients.*
Children's Hospital of Philadelphia	*The communication between the needed departments-BMT/Blood Bank/Pharmacy and EP has improved greatly because of doing these exercises each year. We think the biggest strength is should an event happen the key leadership at least understands we have an RITN commitment. Not having to run this exercise also allows us to focus on the discussion rather that the facilitation of the discussion.*
City of Hope Medical Center	*City of hope is ready to handle numerous samples to conduct matching needs, we are also amply stocked with appropriate treatment pharmaceuticals.*
Froedtert Hospital & Medical College of Wisconsin	*Having an outpatient BMT day hospital that can take stress off the inpatient BMT Unit. Blood Center of Wisconsin on our campus for HLA typing and input.*
Presbyterian St. Luke's	*I feel that we have a committed team that has discussed many of the potential challenges that we may face. While I think that we would be stretched if an incident did occur, I feel that we have a dedicated team to rise to the challenge. We have a very strong typing lab that will push the testing through quickly, we have an internal blood bank and would be able to mobilize additional donors to meet*

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.	
	our increased need for blood products, we have an involved pharmacy staff that works closely with our team to secure medications and proactively look at potential shortages, and we have a committed and knowledgeable nursing staff.
Rush University Medical Center	*1. Ability to triage patients 2. Use of the RITN SOP 3. Use of internal resources.*
Scripps Green Hospital	*The knowledge to care for the patients. And the capacity to handle the load.*
University of Pennsylvania Medical Center	*Our HLA lab is a strength in that it can complete CT quickly for a large number of patients. They are in the process of changing to next generation sequency which will allow even greater number of patients to be typed quickly. They have the capability to use either blood or buccal swabs. .*

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.	
All Children's Hospital	*Although we could request increased pharmaceuticals from supplier, dependent on the extent of the incident- centers across the country could be making similar request of their suppliers resulting in supply/demand issues. There are 4 RITN centers in Florida and 3/4 are supplied blood products by same blood center. Thus the increase need for blood products could also lead to shortage.*
Barnes-Jewish Hospital	*One challenge is off site lodging. We have a free housing facility that requires a diagnosis of cancer, conversations will have to occur with the American Cancer Society to allow patients and family members to stay at the facility..*
Children's Hospital of Philadelphia	*The turn around time on HLA typing and reaching related donors who potentially would be in the area where that incident happened. We think if an NMDP donor center is in that area that could be used to type family donors and potentially work up and collect the cells from the donor.*

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.	
City of Hope Medical Center	*Difficulty in obtaining samples from family members if the family members are not present, especially if the family members are in the zone of the attack. We also worry about public perception and staff perception of bringing these patients here.*
Froedtert Hospital & Medical College of Wisconsin	*Housing and resources for patients and families having to stay in the area. Length of time patients would need to stay post transplant if issues like GVHD occur.*
Presbyterian St. Luke's	*It would be challenging to get our current patients moved around or discharged to accommodate the influx of new patients on short notice. It would be a challenge to secure the antibiotics that are currently in short supply. We would need to work with pharmacy and the infectious disease doctors to ensure appropriate antibiotic coverage and appropriate replacements. While we have outpatient housing available to us, we would be discharging our patients in addition to getting new patients needing housing through the RITN incident. This would take some time to finesse housing placements in addition to helping with housing of family members that may arrive at our site. Transportation may need to be arranged for patients in the metro Denver area that need to get into the clinic and that would need to be set up as it is not a service that we currently provide..*
Rush University Medical Center	*1. Identifying resource challenges with the HLA lab 2. Process for housing patients/ family members 3. Know roles and responsibilities within the organization.*
Scripps Green Hospital	*Would like to try a dry run or two to ensure we have all the steps in place and everyone in place.*
University of Pennsylvania Medical Center	*We may not be able to evaluate all potential sibling donors and would need to ask the NMDP for help getting them evaluated. We do not currently have a policy in place to allow us to accept an evaluation completed outside of our facility. .*

List and briefly discuss elements to address for future RITN exercises.

List and briefly discuss elements to address for future RITN exercises.	
All Children's Hospital	*No response provided.*
Barnes-Jewish Hospital	*No response provided.*
Children's Hospital of Philadelphia	*For us if the Peds patients show up without a legal guardian/parent- we would have to admit that patient. Therefore all these patients would be inpatients. We like that this was more clinically focused!*
City of Hope Medical Center	*Family reunification and maintaining care / treatment plans of people after they are better. Also, if exposure was very high and there was a high death rate, would there be need for mass fatality planning. (However, this is probably more of an issue for the local area.).*
Froedtert Hospital & Medical College of Wisconsin	*Financial resources!*
Presbyterian St. Luke's	*An event with larger numbers ie: 50 patients, would challenge us to look closer into systems and our capacity to handle the volume. Things such as at what point do we need to ask for HLA typing help, when do we look at transferring a service line out of our hospital (ie: the ortho surgeries) to a sister hospital to make more room for casualties, how well is our outpatient housing going to hold up, all of the things that are magnified when the volume is larger.*
Rush University Medical Center	*1. More clinical cases to address BMT capabilities 2. Limit responses to hospitals - pick one issue per hospital to get varied discussions as opposed to repeated information.*
Scripps Green Hospital	*None- as a first it was amazing.*
University of Pennsylvania Medical Center	*Our center really liked the focus on the clinical aspect of patients received in this exercise. It gave us the opportunity to review our current guidelines and standards to help determine how to manage casualties receiving different levels of internal and external contamination. It was a good exercise for all involved in this multidisciplinary group.*

APPENDIX E: ACRONYMS

Acronym	Term
AAR	After Action Report
AmGen	AmGen Biologics
ASPR	Assistant Secretary for Preparedness and Response
BMT	Bone Marrow Transplantation
FCC	Federal Coordinating Center
G-CSF	Granulocyte Colony-Stimulating Factor
HCS	Healthcare Standard
HHS	Health and Human Services
HLA	Human Leukocyte Antigen
HSV	Herpes Simplex Virus
IV	Intravenous
NMDP	National Marrow Donor Program
NDMS	National Disaster Medical System
PCP	Pentachlorophenol
RED	Radiological Exposure Device
RITN	Radiation Injury Treatment Network
SITREP	Situation Report
SNS	Strategic National Stockpile
TTX	Tabletop Exercise