Radiation Injury Treatment Network

Laboratory Surge Tabletop Exercise

After Action Report

Grady Health System

Exercise Date: September 24, 2021

ADMINISTRATIVE HANDLING INSTRUCTIONS

1. The title of this document is the *Grady Health System/Emory Radiation Injury Treatment Network (RITN) Laboratory Surge Tabletop Exercise (TTX): After Action Report (AAR).*

2. Some of the material in this AAR may be considered sensitive.

3. Reproduction or distribution of this document, in whole or in part, without prior approval from RITN is prohibited.

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EXECUTIVE SUMMARY

On September 24, representatives from Grady Health System, Emory, and RITN conducted a tabletop exercise to address laboratory surge following an improvised nuclear device (IND) detonation in a distant city. The primary strengths and opportunities for improvement discovered during this exercise are listed in this executive summary below.

Primary Strengths

The major strengths identified are as follows:

- Grady's laboratory capabilities include sufficient analytical laboratory equipment, supplies, staff and throughput capability to meet the testing demand as defined in this scenario.
- Grady has a laboratory surge plan in place to call back additional staff in the event of an emergency.
- CDC indicated that they could provide resources to Grady for educating staff about radiation hazards and occupational safety, if necessary. In addition, Grady could request help form the Georgia Department of Public Health that has up to 18 radiation portal monitors (RPMs) and digital radiation survey meters deployed across the state.
- There are potential capabilities to share laboratory testing information through the Grady Electronic Medical Record, EPIC and other electronic medical record products that interface with EPIC. People outside of Grady can be granted viewing access of lab results via the Care Everywhere function.
- Supply chain impacts could be mitigated through vendor relationships and proximity to Atlanta.

Primary Opportunities for Improvement

- There is a need to identify just-in-time training capabilities at Grady for staff to provide them basic radiation safety and emergencies awareness.
- There is a need to further coordinate with local and state public health authorities to determine how large-scale processing sites will be established for self-evacuated patients.
- Grady should consider keeping a roster of retired laboratory professionals in the event there is a need to call them back to volunteer for laboratory surge emergencies.

- While Grady does keep an approximate 30-day supply of laboratory consumables on-hand, it should be considered that impacts on the supply chain and increased demand nationwide will likely result in a shortage.
- Additional planning and coordination should occur between Grady and Emory to discuss the process and resources for human leukocyte antigen (HLA) typing in this scenario.

EXERCISE OVERVIEW

Exercise Name	Grady Health System/Emory Radiation Injury Treatment Network (RITN) Laboratory Surge Tabletop Exercise (TTX)
Date	September 24, 2021
Purpose & Scope	The purpose of the exercise is to assess the ability of the laboratory at Grady Health System to support the expected surge in patient clinical care needs after a nuclear detonation in an adjacent state. • There are many response considerations for a nuclear detonation; this exercise will focus on: ✓ *Coordination* ✓ *Laboratory testing and throughput* ✓ *Receipt/interpretation of results* ✓ *Staff and equipment needs* ✓ *Outpatient testing capabilities and needs* • It will not focus explicitly on other aspects apart from general discussion of: ✓ *How alternate care/triage sites support laboratory testing and triage* ✓ *Triage of exposed people that require blood collection to determine treatment needs*
Mission Area(s)	Response
HPP Capabilities	Healthcare and Medical Response Coordination Medical Surge

Objectives	1. Assess the ability of the hematology laboratory to meet the increase in demand for Complete Blood Counts (CBC) with Differential Counts. 2. Assess the ability of the clinical chemistry laboratory to meet the increase in demand for Comprehensive Metabolic Panels. 3. Assess the ability of the coagulation laboratory to meet the increase in demand for coagulation parameters. 4. Assess the ability of the blood bank to meet the increase in demand for blood products. 5. Address outpatient laboratory testing needs and capabilities. 6. Identify staff, equipment, and other resource needs to include supply chain disruptions. 7. Prioritize the most significant gaps that need to be addressed to effectively manage a lab surge on a mass scale.
Hazards	10kT Improvised Nuclear Device (IND) in a distant (>500 miles) city (Jacksonville, FL)
Sponsors	Radiation Injury Treatment Network (RITN)

EXERCISE AGENDA

Time	Item
10 min	Introductions, Purpose, and Objectives
5 min	Improvised Nuclear Device (IND) Scenario
30 min	Module 1: Activating, preparing, and resourcing the laboratories for surge (e.g., staff, equipment, supplies).
30 min	Module 2: Receiving samples, throughput, result reporting, outpatient testing, and blood product availability
10 min	Hot Wash
	Adjourn

STRENGTHS & OPPORTUNITIES

Module 1: Activating, preparing, and resourcing the laboratories for surge (e.g., staff, equipment, supplies)

Strengths:

1. Grady would immediately standup their incident command system (ICS) to include medical-technical specialists with expertise in radiation injury response (e.g., radiation safety officer [RSO], laboratory liaison, emergency medicine, hematology-oncology and medical toxicology).
2. There were laboratory surge lessons learned from Grady's COVID-19 response to include utilization of large alternative care sites where sample collection was performed (e.g., the model utilized at the Georgia Congress Center). This also included the use of existing courier resources to shuttle samples back to the Grady laboratory.
3. In the event patients self-report to the Grady Emergency Department (ED) from an impacted IND detonation site, there are phlebotomists in the Grady ED that would be at the ready to collect samples.
4. While laboratory-specific radiation training does not exist at Grady, they could utilize radiation safety officers and they could leverage local resources at Emory and CDC (from the Radiation Studies Program) for development of a just-in-time training need. It was also noted from CDC that as long as they are utilizing universal precautions, the risk of contamination is extremely low (this fact should be emphasized in the training).
5. Grady has a laboratory surge plan in place to call back additional staff in the event of an emergency.
6. CDC indicated that the Georgia Department of Public Health could provide resources to Grady for radiation surveys, if necessary. In addition, they could utilize up to 18 radiation portal monitors (RPMs) from the State of Georgia.
7. Grady has multiple analyzers (4 DX-9000s) at the main hospital laboratory. In addition, there are two off-site locations (Camp Creek Office and IVP Laboratory) with analyzers that could be activated and staffed to meet this surge demand. Grady maintains approximately a 30-day supply of chemistry and hematology consumables for these analyzers.

8. Blood products could be readily accessed from the American Red Cross (ARC) within two hours.

Areas for Improvement:

1. There is a need to identify just-in-time training capabilities at Grady for staff to provide them basic radiation awareness. There are some excellent resources available from RITN that can be found at: https://ritn.net/training/. There may be a need to identify and/or develop some laboratory-specific radiation training.
2. There is a need to further coordinate with local and state public health authorities to determine how large-scale processing sites will be established for self-evacuated patients and how these sites will coordinate with local health systems (e.g., Emory and Grady) for specimen collection and results reporting.
3. The State of Georgia Department of Public Health has a surge plan to reach out to volunteers for retired radiation safety professionals in addition to accessing some of this expertise through their medical reserve corps (MRC). Grady should consider keeping a roster of retired laboratory professionals in the event there is a need to call them back to volunteer for laboratory surge emergencies.
4. While Grady does keep an approximate 30-day supply of laboratory consumables on-hand, it should be considered that impacts on the supply chain and increased demand nationwide will likely result in a shortage. Discussions, should be had at the State and Federal level of whether or not stockpiles or caches of these consumables should be maintained.

Module 2: Receiving samples, throughput, result reporting, outpatient testing, and blood product availability

Strengths:

1. There are no restrictions around volume of patients with the current EPIC electronic medical reporting system. However, it should be noted that the patients who are providing CBC samples at large processing sites (e.g., the Georgia Congress Center) will not be on site at Grady. This would result in the need to create a new department for data capture and patient tracking and results sharing. They could utilize auto-faxing capabilities and/or EPIC-CARE-LINK for sharing of this information, regardless of location. In addition, they could readily share information with other EPIC users through the Care Everywhere function.
2. While there are some concerns about the impact of supply chains for laboratory consumables, it should be noted that Beckman-Coulter has a warehouse in Kentucky where they get most of their supplies. Current agreements stipulate that these consumables would be available within 1-2 days. If Grady did receive additional supplies from vendors that they could convert areas to store additional supplies.
3. Grady's Lab current daily volume is 2,000 samples for chemistry and 2,000 for hematology. If they utilized all instruments, they could easily double that number (4,000/4,000 respectively). Absolute lymphocyte count (ALC) is automated in the current instruments. If necessary, there are capabilities to conduct manual analyses on low lymphocyte counts.
4. In terms of the prioritization of samples, these would be developed by leadership. If necessary, they could frontload any of the samples on the current analyzers to include full cytometry.
5. American Red Cross would coordinate collection of blood products at various donation centers. In addition, Grady could serve as a donation center. It is expected that from past events, the public steps up and increases donations in times of emergency. Grady maintains additional cold storage for blood products, if necessary.

Areas for Improvement:

1. While EPIC and the other tools mentioned in the strength above enable Grady to view results, there is a need to further examine the ability to input medical orders for patients at offsite locations.

2. In the event HLA typing is required, there needs to be specific phlebotomy collection supplies (separate tube) for this analysis. Additional planning should occur to ensure there are processes in place to collect these types of samples for radiation surge events. Additional planning and coordination should occur between Grady and the Emory Stem Cell Transplant/RITN center to discuss the process and resources for HLA typing in this scenario.

PARTICIPANT FEEDBACK

Briefly describe the 1 or 2 strengths demonstrated as it relates your organization's response during today's exercise.

- *Our strength is the great relationship we have with our vendors and our blood supplier. I also think the extra supplies that we have should get us thru a crisis like described until we can get other supplies and reagents.*
- *Defined unanticipated needs and created action items to move forward*
- *Relationships in place to coordinate an event like this*
- *I'm pleased that the response of the laboratory appears robust for this kind of emergency and that important lessons learned from the COVID-19 response can be incorporated.*
- *We now have a better understanding of the capabilities of an organization in a neighboring state and one that might be calling us for assistance in a radiological event*

Briefly describe 1 or 2 challenges or gaps you observed in your organization's response in this exercise.

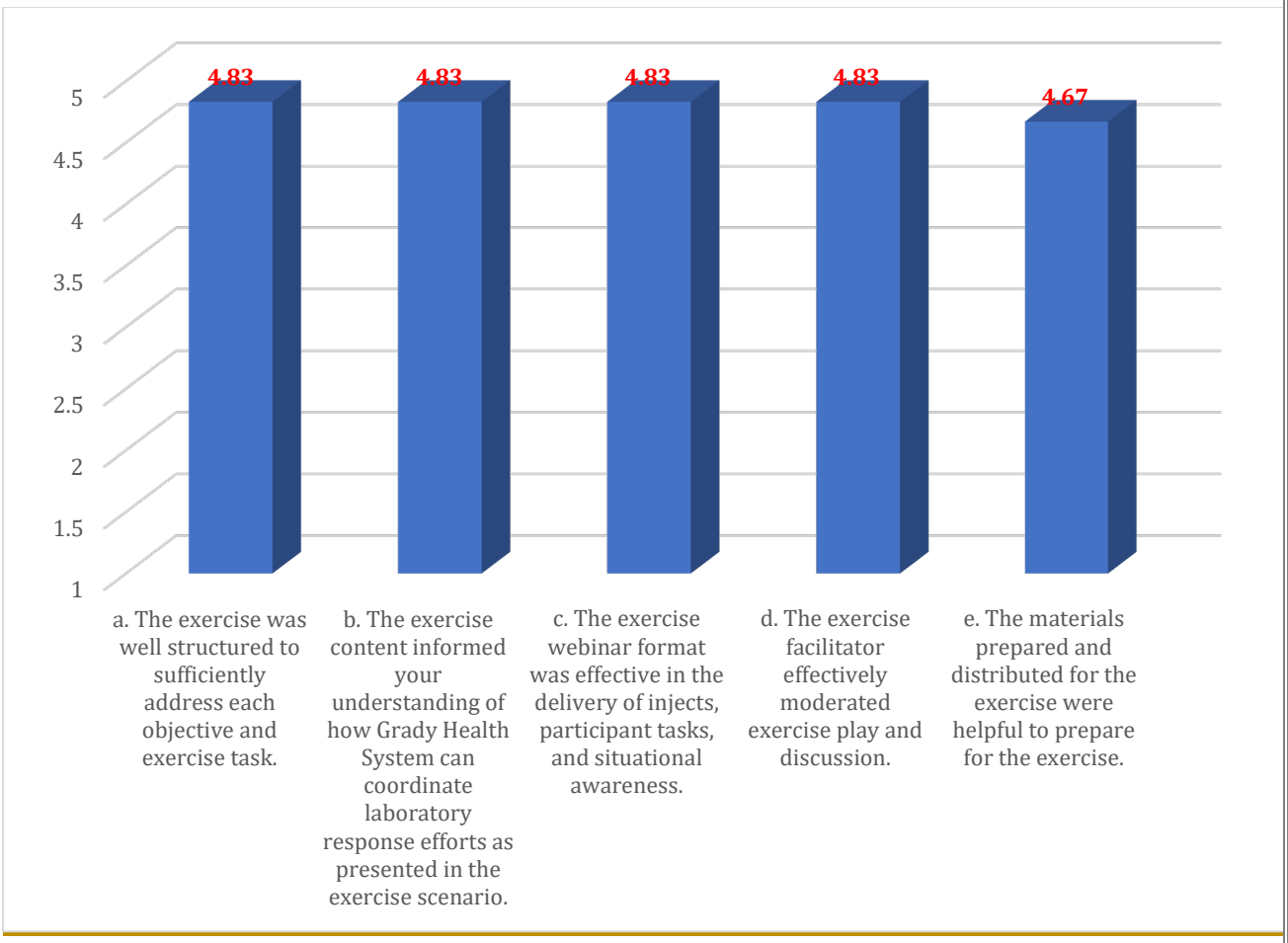
- *Gap in the training for radiation*
- *Radiation exposure training for all employees remote ordering and resulting capabilities*
- *Radiophobia is endemic, but more training and familiarity with the principles of radiation protection can help staff deal with the (admittedly slight) risks.*

What recommendations do you have for future preparedness efforts at Grady Health System for radiation-injury surge events? That is, what should be considered for future planning, training, or exercises?

- *Excellent scenarios and well planned. Great questions. Continue with the good work*
- *Staff exercises (medical, environmental, lab etc.) In time training - app vs module vs in person course*
- *We should continue to have these discussions as we will likely learn something new each time. Expand the stakeholders involved*
- *I think a practical exercise in hotlines, to survey and decontaminate incoming patients and exercise RITN principles would be useful.*

- *This exercise seemed to work well and it allowed a venue for discussion. Perhaps doing this more frequently to keep new people apprised and to see gaps filled would be helpful.*

What is your assessment of the exercise design and conduct? Please rate, on a scale of 1 to 5, your overall assessment of the exercise relative to the statements provided below, with 1 indicating strong disagreement with the statement and 5 indicating strong agreement.



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ACRONYMS

Acronym	Meaning
AAR	After Action Report
ALC	Absolute Lymphocyte Count
ARC	American Red Cross
BMT	Bone Marrow Transplant
CBC	Complete Blood Count
CDC	Centers for Disease Control and Prevention
ED	Emergency Department
FCC	Federal Coordinating Center
HHS	Health and Human Services
HLA	Human Leukocyte Antigen
ICS	Incident Command System
IND	Improvised Nuclear Device
MRC	Medical Reserve Corps
NDMS	National Disaster Medical System
NMDP	National Marrow Donor Program
RITN	Radiation Injury Treatment Network
RPM	Radiation Portal Monitor
RSO	Radiation Safety Officer

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