

# Medical Response to an Improvised Nuclear Device Workshop

Illinois EMS Region 8  
Healthcare Coalition  
February 28, 2020





## WORKSHOP OVERVIEW

<b>Exercise Name</b>	Region 8 Medical Response to an Improvised Nuclear Device (IND) Workshop	
<b>Exercise Date</b>	February 28, 2020	
<b>Core Capabilities</b>	Public Health & Medical Services and Operational Coordination	
<b>Objectives</b>	<ol style="list-style-type: none"> <li>1. Identify needs for alternate care in areas within close proximity (i.e. not within the fallout zone and outside of the physical damage areas) of the IND detonation.</li> <li>2. Identify needs for laboratory testing (e.g. rapid dosimetry, CBCs) to determine early treatment needs.</li> <li>3. Determine sources for making baseline dose estimates (e.g. through geo-epi, lab testing, etc.).</li> <li>4. Identify a process for identifying and differentiating medical evacuees with traumatic injuries as well as radiation-only injuries.</li> <li>5. Address high demand/short supply resources (e.g. clinicians, lab testing, medical countermeasures, equipment, etc.) that need to be considered in austere environments leading to crisis standards of care.</li> </ol>	
<b>Threat or Hazard</b>	Nuclear (Improvised Nuclear Device)	
<b>Scenario</b>	Medical surge due to a detonation of an Improvised Nuclear Device (IND) in a nearby urban area.	
<b>Sponsor</b>	Radiation Injury Treatment Network (RITN)	
<b>Points of Contact</b>	Curt Mueller, MEP NMDP/RITN <a href="mailto:curt.mueller@nmdp.org">curt.mueller@nmdp.org</a>	Paul Banks, MBA, IPEM Loyola University Medical Center <a href="mailto:pabanks@lumc.edu">pabanks@lumc.edu</a>

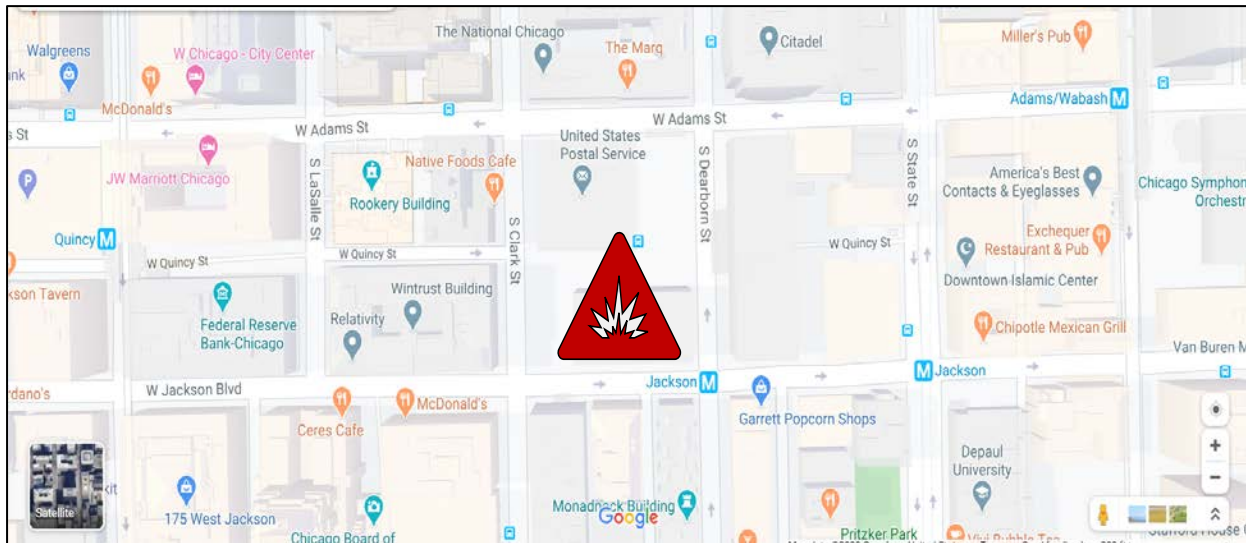
## EXERCISE AGENDA

<b>Time</b>	<b>Item</b>
8:00 AM	Registration
8:30 AM	Opening Remarks and Introductions
8:45 AM	RITN Overview (RITN)/Cytokine Guidelines
9:15 AM	ASPR/BARDA Presentation
9:45 AM	Illinois Medical Emergency Response Team Overview
10:00 AM	Improvised Nuclear Device (IND) Scenario
10:15 AM	Break
10:30 AM	Module 1: Setting up, and resourcing alternate care site (e.g. staff, equipment, medications)
11:30 AM	Lunch
12:00 PM	Module 2: Decontamination, symptom triage, and lab testing at alternate care site
12:45 PM	Brief-outs and Way Forward
1:30 PM	Adjourn

## EXERCISE SCENARIO

10kT Improvised Nuclear Device (IND) is detonated in Chicago near Jackson and Clark on a Spring day at 12:00 PM

### General Area



### General Scenario Assumptions

- It is assumed that the inner-city resources may be depleted and that neighboring jurisdictions will be overwhelmed with demands for medical care (i.e. those fleeing the impacted city).
- It is further assumed that neighboring jurisdictions/suburbs will need to activate alternate care sites.
- It is expected that neighboring jurisdictions will need to resource (i.e. staff, equipment, and supplies) for alternate care sites within 48 hours.
- It is expected that neighboring jurisdictions will need to immediately implement alternate care plans (sites and resources) in and around the hospitals to manage the expected surge.
- Assessments for housing needs will need to be made for those who present at medical facilities.

**Casualty Breakdown**

	Uninjured	Recover	At Risk	Expectant	Dead
Severe Damage Zone	0	939	10,276	91,489	210,888
Moderate Damage Zone	24,729	27,027	58,756	79,303	12,550
Light Damage Zone	184,975	67,745	76,350	82,568	0
Fallout Only Zone	554,928	80,639	25,637	0	0
<b>Totals</b>	<b>764,632</b>	<b>176,352</b>	<b>171,020</b>	<b>253,362</b>	<b>223,439</b>

**Injury Types**

- Primary blast injury — direct effects result from barotrauma (e.g., over pressurization and under pressurization) commonly affecting air-filled organs and air-fluid interfaces
  - Rupture of tympanic membranes: Injury to ear drum: 5 psi
  - Pulmonary damage: Injury to lung: 15 psi
  - Rupture of hollow viscera: Injury fatal (LD50): 50 psi
- Secondary blast injury
  - Penetrating trauma
  - Fragmentation injuries
- Tertiary blast injury — effects of structural collapse and of persons being thrown by the blast wind
  - Crush injuries and blunt trauma
  - Penetrating or blunt trauma
  - Fractures and traumatic amputations
  - Open or closed brain injuries

## MODULE 1: SETTING UP, AND RESOURCING ALTERNATE CARE SITE (E.G. STAFF, EQUIPMENT, MEDICATIONS)

### Public Health, EMAs, and RHCCs

- Identify sites within your jurisdiction for Community Reception Centers (CRCs) and centralized alternate care sites
  - Sketch out how these sites will be utilized
- Develop checklists for equipment and supply needs at CRCs and alternate care sites.
- What would be the strategy to divert people from hospitals and to these sites? Develop a public information statement to this effect.
- What can be done to increase blood collections across the Region? Consider the need to have irradiated blood products.

### Hospitals

- Identify locations in and around YOUR hospital to setup alternate care for radiation injuries
- Review available equipment and supplies for alternate care sites (e.g. space/tents, equipment and supply caches).
  - Develop a listing of supplies
  - Develop a staffing/shift plan for alternate care sites
  - Identify sources for rapid deployment of staff (e.g. volunteer pools, deployment from in-system hospitals).
- Review available blood supplies and develop strategy for increased collection centers. What capabilities does your hospital have to ensure blood is irradiated?
- What units could/would be immediately decompressed to accommodate those with higher acuity?
- Medication availability for radiation injuries (G-CSF; rapid acquisition within 48 hours); outline a strategy for rapid acquisition
- What is the patient flow for sites? Draw it out
- What hours would you be able to staff this site?

## MODULE 2: SYMPTOM TRIAGE AND LAB TESTING AT ALTERNATE CARE SITE(S)

### Public Health, EMAs, FCC and RHCCs

- Identify capabilities and priorities within the Coalition or Region to care for the expected number of victims by triage category.
- How will incoming patients to the CRCs be screened for radiation?
- Determine a strategy for technical decontamination at the CRCs and Alternate Care Sites
  - Who will perform it? Be specific
- What is the process for reporting up to and through IDPH and ASPR to the FCC on patients that require evacuation? Describe the process for this information flow and the information that is necessary to receive.
- Laboratory Surge:
  - Identify staff to provide phlebotomy
  - Integrate into alternate care concept
  - Identify locations to rapidly acquire blood collection supplies
  - Identify laboratories (fixed and mobile) to conduct initial CBC analysis
  - Address processes to perform rapid diagnostic testing to determine radiation exposure levels (e.g., ALCs, radiation biodosimetry, microRNA signature rapid/handheld tests)
  - Address processes to report patient results into a database/portal that allows access to providers

### Hospitals

- Utilize the Exposure Assessment and Symptom Triage (EAST) tool or other radiation triage methods for triage categories on the following slide
- Utilize triage findings to make decisions related to administration of G-CSF / cytokines prioritizations or on priorities for evacuation.
- How will patients at your hospital be screened for radiation (i.e. prior to decon)?
- Document your decon strategy:
  - Who performs? Where will it be staged?
  - Plans for decon of personnel and management of waste?
  - What is decon throughput estimate at your facility?
- Determine the levels of care for patients in each of the following categories:
  - <2 Gy
  - 2-4 Gy
  - 4-6 Gy
  - 6-8 Gy
  - >8 Gy
- What other information would be necessary to support your decisions for the above?



**ACRONYMS**

<b>Acronym</b>	<b>Term</b>
AAR	After Action Report
ALC	Acute Lymphocyte Count
ARS	Acute Radiation Syndrome
ASPR	Assistant Secretary for Preparedness and Response
BMT	Bone Marrow Transplantation
CBC	Complete Blood Count
CRC	Community Reception Center
EAST	Exposure Assessment and Symptom Triage
EMA	Emergency Management Agency
EOC	Emergency Operations Center
FCC	Federal Coordinating Center
G-CSF	Granulocyte-Colony Stimulating Factor
Gy	Gray
HLA	Human Leukocyte Antigen
IDPH	Illinois Department of Public Health
IND	Improvised Nuclear Device
kT	Kiloton
NMDP	National Marrow Donor Program
NDMS	National Disaster Medical System
RHCC	Regional Hospital Coordinating Center
RITN	Radiation Injury Treatment Network
RTR	Radiological Triage, Transport, and Treatment
SITMAN	Situation Manual