

Welcome



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The following speakers have reported no relevant financial relationships with an ineligible company:

Cullen Case, Jr., MPA, CEM, CBCP, C)DRE, CHEP

The following speakers have reported a relevant financial relationship with an ineligible company:

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MGH Center For Disaster Medicine Series 2023- 2024

Topic Title | Date | Time

Learning Objectives

Upon completion of this activity, participants will be able to:

1. Participants will be able to identify and describe the hallmarks and treatment needs of patients with Acute Radiation Syndrome (ARS)
2. Participants will be able to describe the Radiation Injury Treatment Network (RITN) and its role following a radiological incident
3. Participants will be able to integrate the information from this session into their facility planning for care and treatment of radiation injured patients

Target Audience

This activity is intended for Hospital and clinic administrators, emergency managers, nurses, providers, respiratory therapists and other leaders.

Course Director

Eileen Searle, PhD, RN
Director of Funded Projects,
Massachusetts General Hospital

Speaker/Faculty

Cullen Case, Jr., MPA, CEM, CBCP, C)DRE, CHEP

SMS Code for Attendance: ZUZKUL to 857-214-2277

ACCREDITATION

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The sessions in this series are being recorded for reference purposes (not for credit).



This session will broadcast outside of Mass General Brigham



Mass General Brigham

Hospital and Healthcare Planning Considerations for Radiological Incident Response

Cullen Case, Jr., MPA, CEM, CBCP, C)DRE, CHEP

August 11, 2023

Center for Disaster Medicine – Region 1 Disaster Health Response System and Regional Emerging Special Pathogens Treatment Center

Housekeeping

- The recording and slides for today's webinar will be made available on the Region 1 Disaster Health Response System website at (<https://www.rdhhs.org/regional-webinars/>)
- To limit background noise, your microphone has been muted for the duration of the webinar.
- We encourage your questions and comments! If you have a question or comment at any point during the webinar, you can type your questions into the Q&A box.
- Join the conversation on social media by following & tweeting @Region1RDHRS



Acknowledgement

This webinar is presented by the Regional Emerging Special Pathogens Treatment Center (RESPTC) in collaboration with the Region 1 Disaster Health Response System (RDHRS). Both programs are funded by the Administration for Strategic Preparedness and Response (ASPR) within the US Department of Health and Human Services.



Disclosure

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- No information provided in this presentation is meant to provide specific medical advice.
- The speakers have no affiliation or financial interests/relationships to disclose.



Moderators & Speakers

Moderator:

David J. Reisman, MHA, FACHE

Associate Director, Center for Disaster Medicine

Region 1 Regional Disaster Health Response System

Speakers:

Cullen Case, Jr., MPA, CEM, CBCP, C)DRE, CHEP

Senior Manager, Business Continuity - National Marrow Donor Program/Be The Match

Program Director - Radiation Injury Treatment Network



Learning Objectives

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-Fortuna Favet Paratis-

est. 2006

Medical Response to Radiological/Nuclear Disaster

Cullen Case Jr.

RITN Program Director

Operated by the National Marrow Donor Program/Be The Match

RITN@nmdp.org

www.RITN.net

June 23, 2023

This project has been supported by funding from the National Marrow Donor Program and the Department of the Navy, Office of Naval Research to the National Marrow Donor Program. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Office of Naval Research or the National Marrow Donor Program.

Agenda

- ARS Intro
- RITN 101
- RITN Concept of Operations
- Resources

Acute Radiation Syndrome Intro

Types of Ionizing Radiation

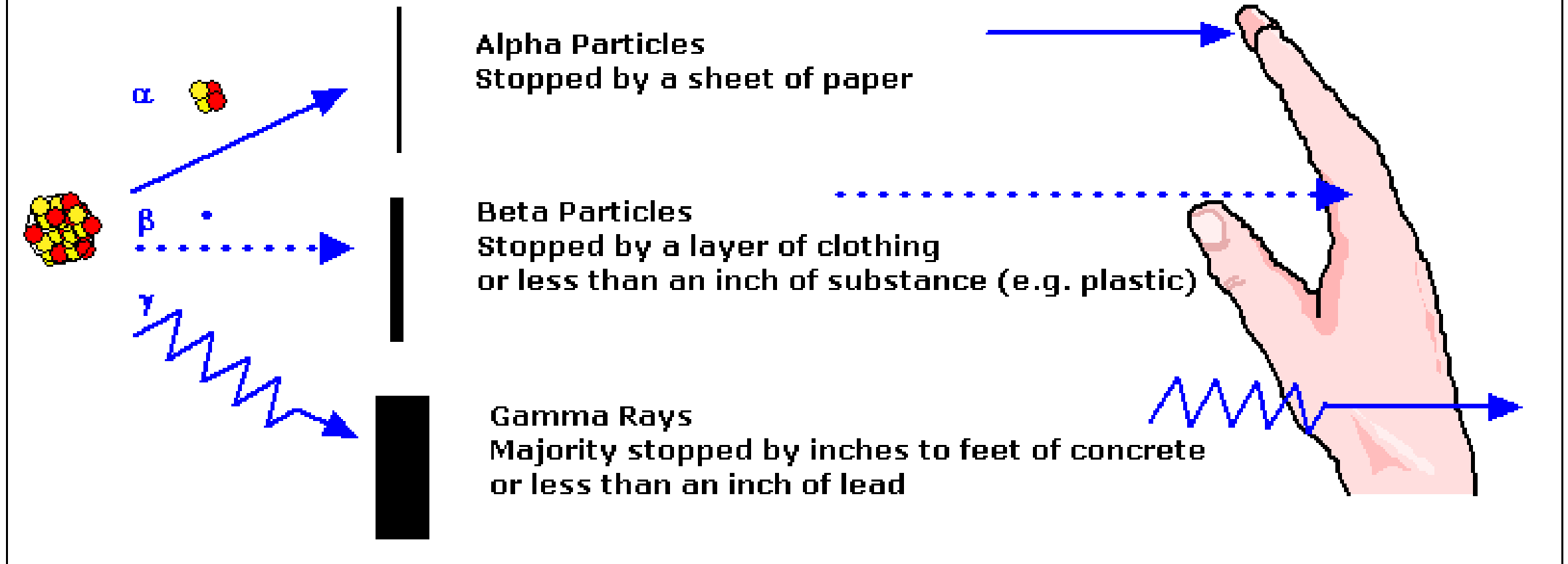


Image Source: REMM.HHS.gov

Types of Injuries After an IND

- Traumatic blast injuries
- Burn injuries
- Radiation injuries
- Combined injuries
 - Trauma or burn + radiation
 - Exponentially more severe
- Flash blindness
- Mental health effects

Patients will not be as dramatic as in HBO's Chernobyl



Image source: <https://variety.com/video/chernobyl-radiation-burns-makeup-prosthetics-hbo/> 20Jun23

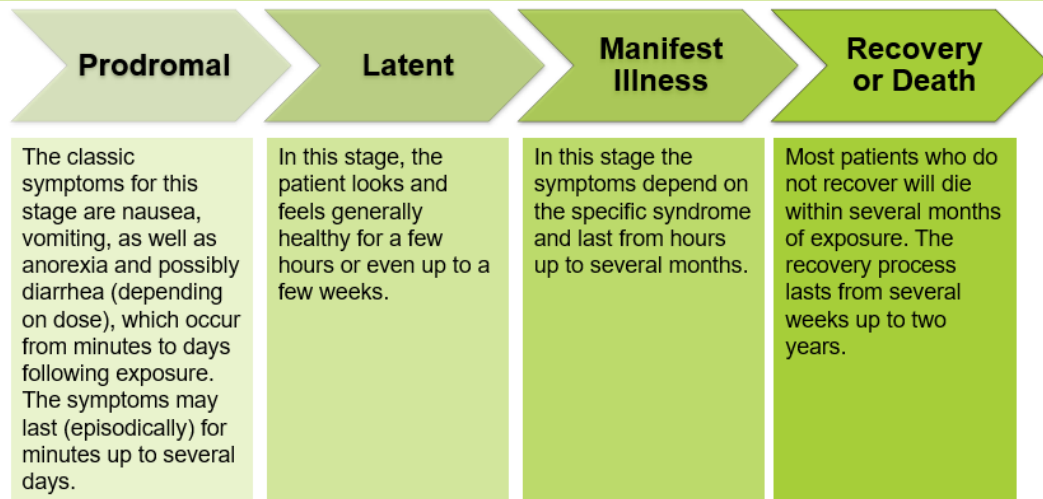
Radiation Injury = Acute Radiation Syndrome (ARS)

- ARS Syndromes:
 - Bone marrow | Cutaneous | Gastrointestinal (GI) | Cardiovascular (CV) | Central Nervous System (CNS)
- With a significant dose it is severe and life-threatening illness
- Occurs in cases of:
 - Exposure of the whole body, or a large part of it, to a high dose of penetrating radiation during a short duration (minutes to hours)
- Due the death of blood forming stem cells in the body and the inability to regenerate damaged cells
- Limited treatment options and no known preventative pharmaceutical

ARS Symptoms

- Immediate and delayed effects (prodromal and latent)
- The classic symptoms for this stage are nausea, vomiting, as well as anorexia and possibly diarrhea (depending on dose), which occur from minutes to days following exposure. The symptoms may last (episodically) for minutes up to several days.

Stages of ARS



Care of ARS

IVF	Neutropenic Precautions	Blood Products
Nutrition	Antiemetics	Antidiarrheals
Analgesics	Antibacterials	Antivirals Antifungals
Colony Stimulating Factors	Psychological Support	Stem Cell Transplant

Rad. Medical Counter-Measures (MCMs) Stockpiled

Many doses stockpiled yet will still require rigorous triage

- Four pharmaceuticals in SNS for ARS
 - Filgrastim – Neupogen – FDA approved March 2015
 - Pegfilgrastim – Neulasta – FDA approved November 2015
 - Sargramostim – Leukine – FDA approved March 2018
 - Romiplostim – Nplate – FDA approved January 2021
- Indicated to increase survival in patients acutely exposed to myelosuppressive doses of radiation (Hematopoietic Subsyndrome of Acute Radiation Syndrome)
 - Approval based on ‘animal rule’
- No requirement for an [Emergency Use Authorization \(EUA\)](#)
 - If used as advised on the drug label for this indication
- For a full list of BARDA medical countermeasures with FDA EUA approval go to:
<https://www.medicalcountermeasures.gov/barda/fdaapprovals/>

There is nothing that can be taken prior to radiation as a protective measure... no prophylaxis MCM

*Slide courtesy of A. Jakubowski

RITN 101

What is RITN?

- RITN is a collaborative effort of hospitals preparing for the medical surge resulting from a distant radiological incident
- Led by the NMDP-Be The Match and the ASTCT (formerly ASBMT)
- Funded by the Office of Naval Research (ONR)
- RITN hospitals prepare to provide specialized care to patients with Acute Radiation Syndrome (ARS) following a mass casualty radiological incident
 - Hospitals near the incident will not be activated as part of the RITN
 - expect to be overwhelmed with response
 - RITN is the hematology/oncology/bone marrow transplantation specialists at each hospital
 - RITN expertise is for “radiation only” injuries, trauma patients will require the trauma to be stabilized before addressing the ARS

RITN Hospitals (see list of hospitals [RITN.net/Map](https://www.RITN.net/Map))



Why Bone Marrow/Cancer Centers?

- Bone marrow is a the most sensitive organ in the body to ionizing radiation
- Exposure causes Acute Radiation Syndrome
- Failure to restore would result in death
- Bone marrow transplants are typically done for blood cancers
- Through cancer treatment process patients are irradiated or given chemotherapy to destroy their immune system (marrow)
- ARS mimics what BMT/hematology/oncology staff see daily while treating patients with blood cancers
- RITN is led by the NMDP-Be The Match and funded by the Office of Naval Research
- Bone marrow transplant units preparing for the medical surge resulting from a distant radiological incident



Image Source: NCI <https://www.cancer.gov/about-cancer/treatment/types/radiation-therapy/radiation-fact-sheet> accessed 11/29/16

Organization and operations

- Funded by →

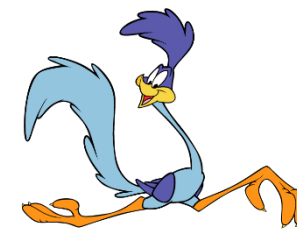


- Operated by →

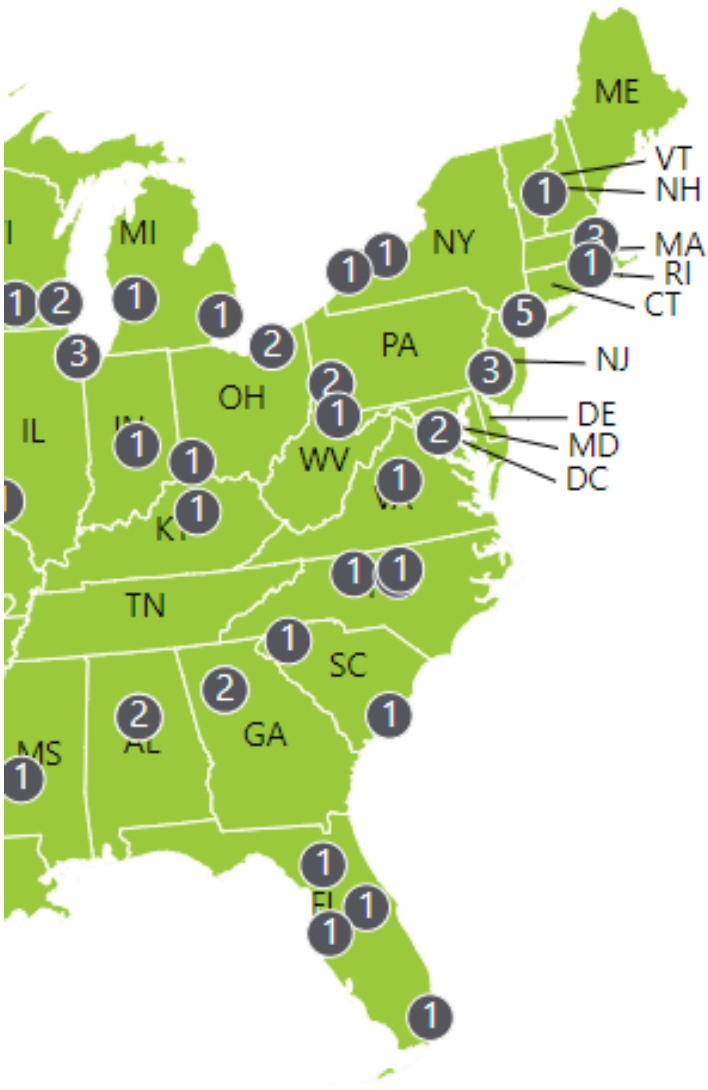


- Managed by →

About
2 ¼
FTEs



RITN Hospitals (see list of hospitals RITN.net/Map)



Region 1 RITN Hospitals

Massachusetts General Hospital	Adult	Boston	MA
Dana Farber/Partners Cancer Care	Pediatric/Adult	Boston	MA
Boston Children's Cancer Center	Pediatric	Boston	MA
Dartmouth-Hitchcock Medical Center	Adult	Lebanon	NH
Roger Williams Medical Center	Adult	Providence	RI



RITN Preparedness Efforts.... Exercises, Training and More....

Since 2006



954 exercises

***All exercise materials available at [RITN.net/exercises](https://www.RITN.net/exercises)



21,917 medical staff trained

***Free web-based courses available at [RITN.net/training](https://www.RITN.net/training)



18,400 dose of G-CSF, Peg G-CSF & GM-CSF on-hand

***Fluctuates throughout year, is sum of inventory at each RITN hospital



2,160 adult & 875 pediatric ARS inpatient beds w/in 24 hrs

2,825 adult & 1,130 pediatric ARS outpatient beds w/in 24 hrs



12,617 total blood stem cell transplants conducted

***during 2020



74 hospitals and cancer centers

***See a map of hospitals at [RITN.net/map](https://www.RITN.net/map)

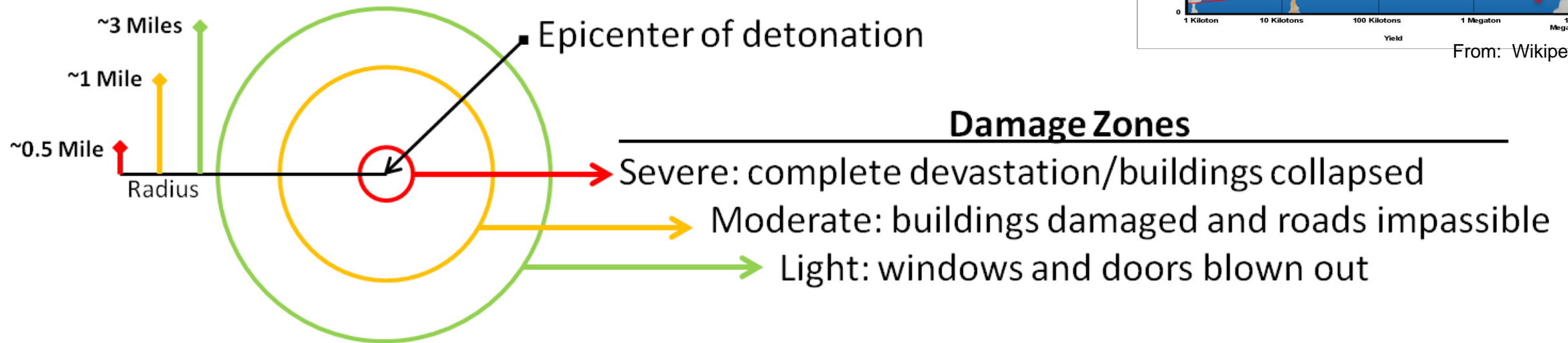
RITN ConOps

Preparing to treat Acute Radiation Syndrome casualties from a distant radiological mass casualty disaster



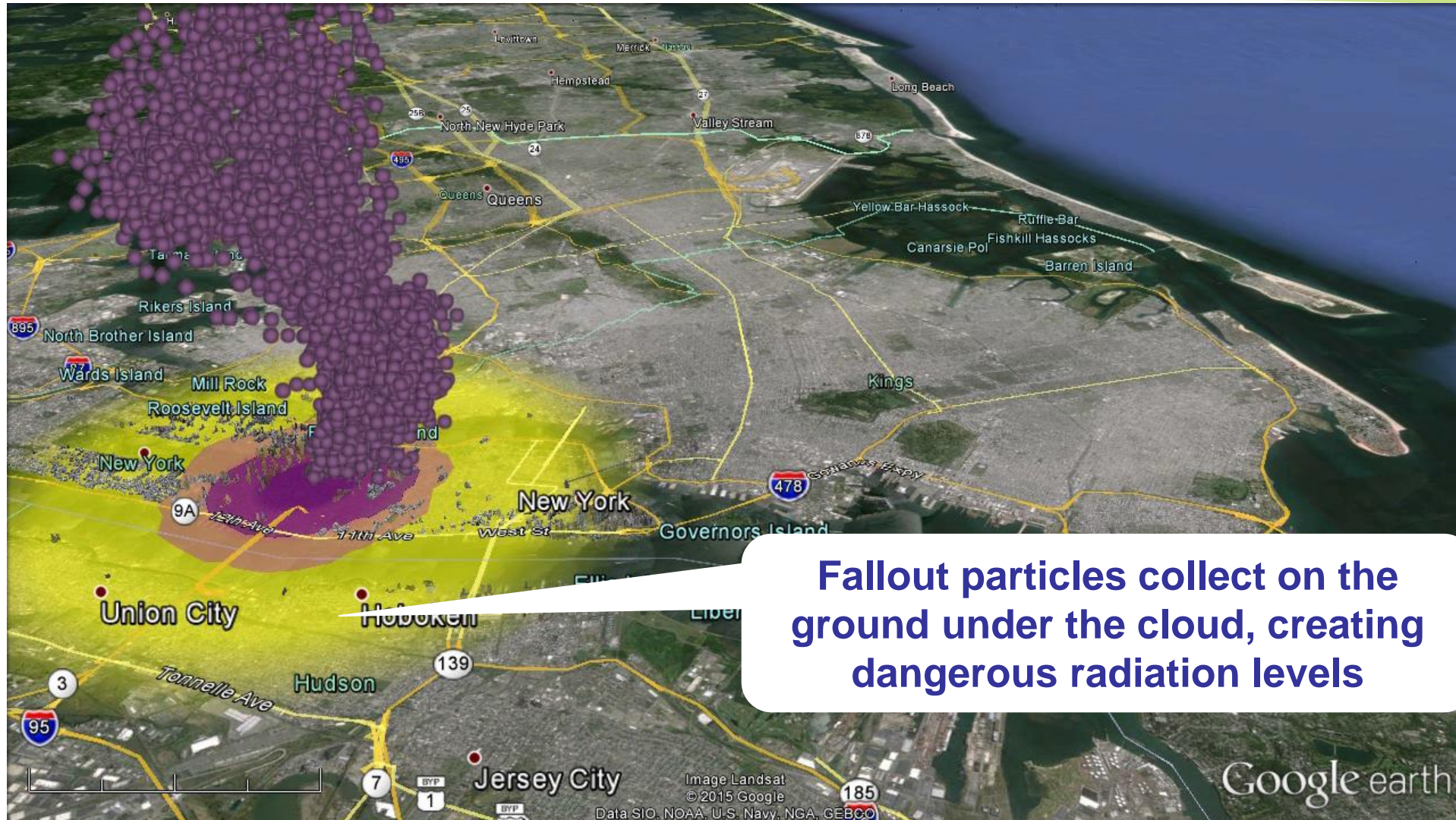
Will Not Be As Catastrophic As A Military Nuclear Weapon

Anticipated Damage Zones from a 10 kT IND



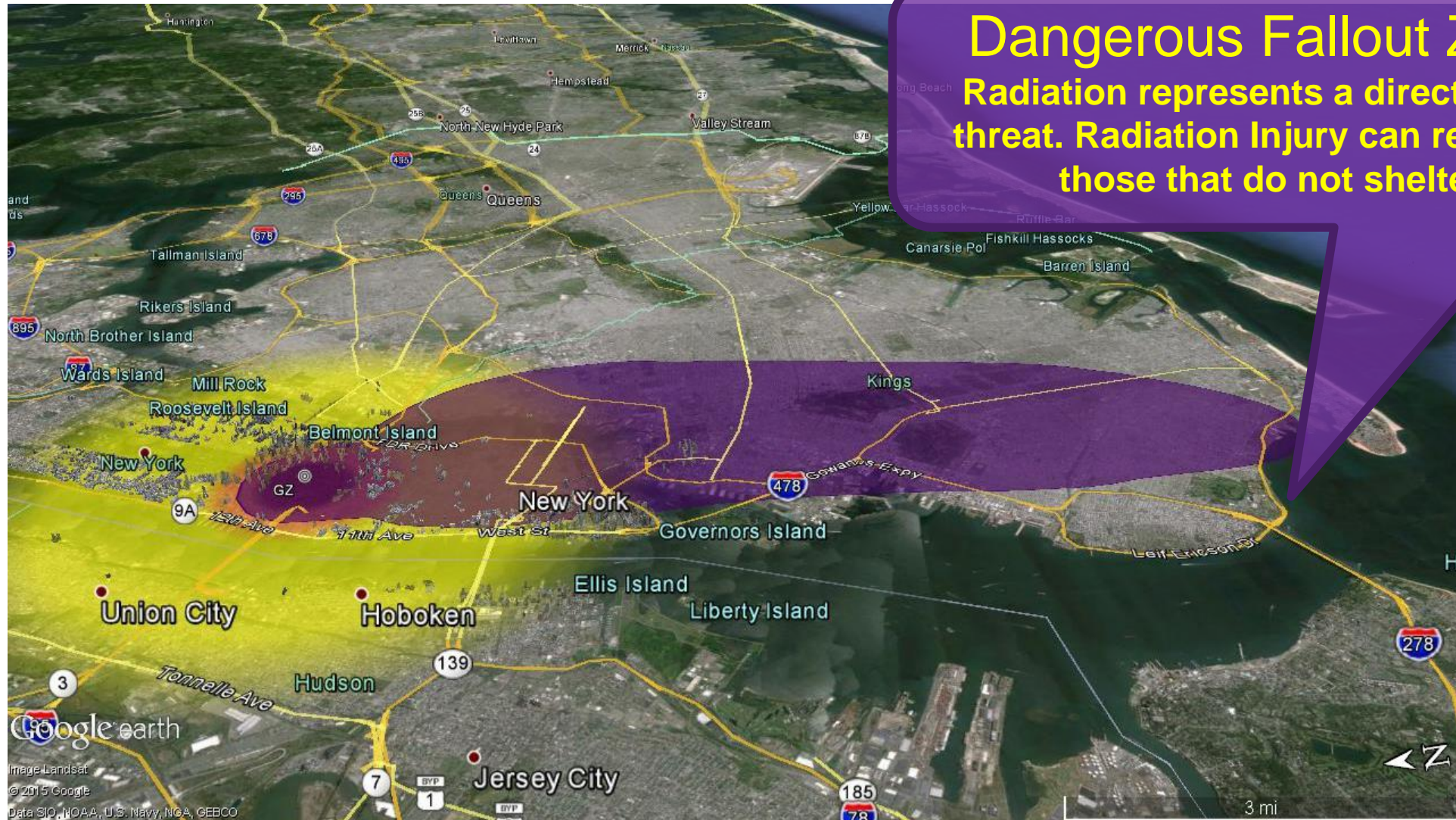
Adapted From: Planning Guidance for Response to a Nuclear Detonation, Second Edition, June 2010

First 2 Hours Of Fallout



Courtesy of Brooke Buddemeier and Lawrence Livermore Laboratory

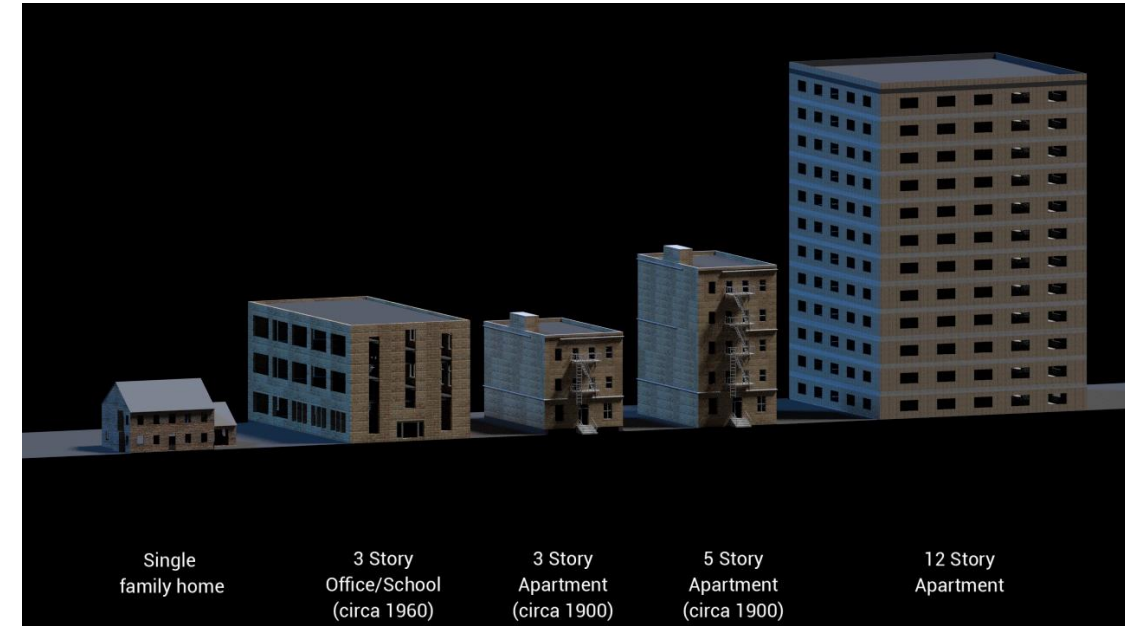
Fallout Extent At 2 Hours



Courtesy of Brooke Buddemeier and Lawrence Livermore Laboratory

The Good Thing About Fallout

- Fallout decays quickly
- Not generally an inhalation hazard
- Easily can protect oneself via shelter



Courtesy of Brooke Buddemeier and Lawrence Livermore Laboratory

Fallout Dissipation

Trivia Geek:
7:10 rule

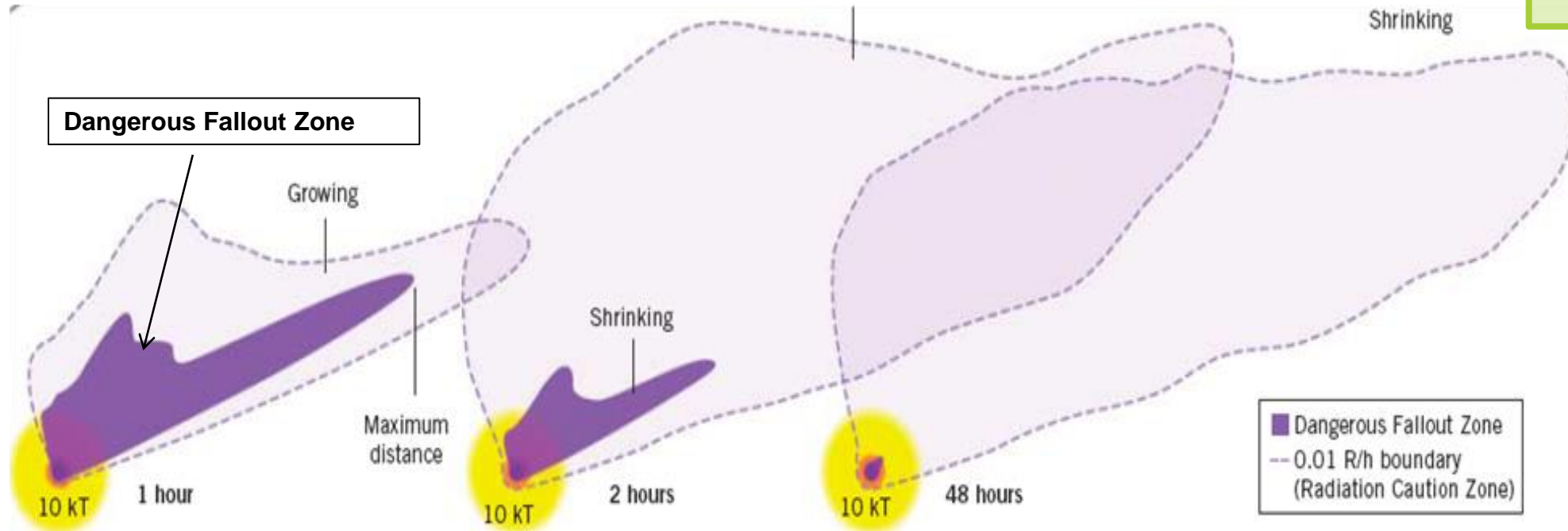
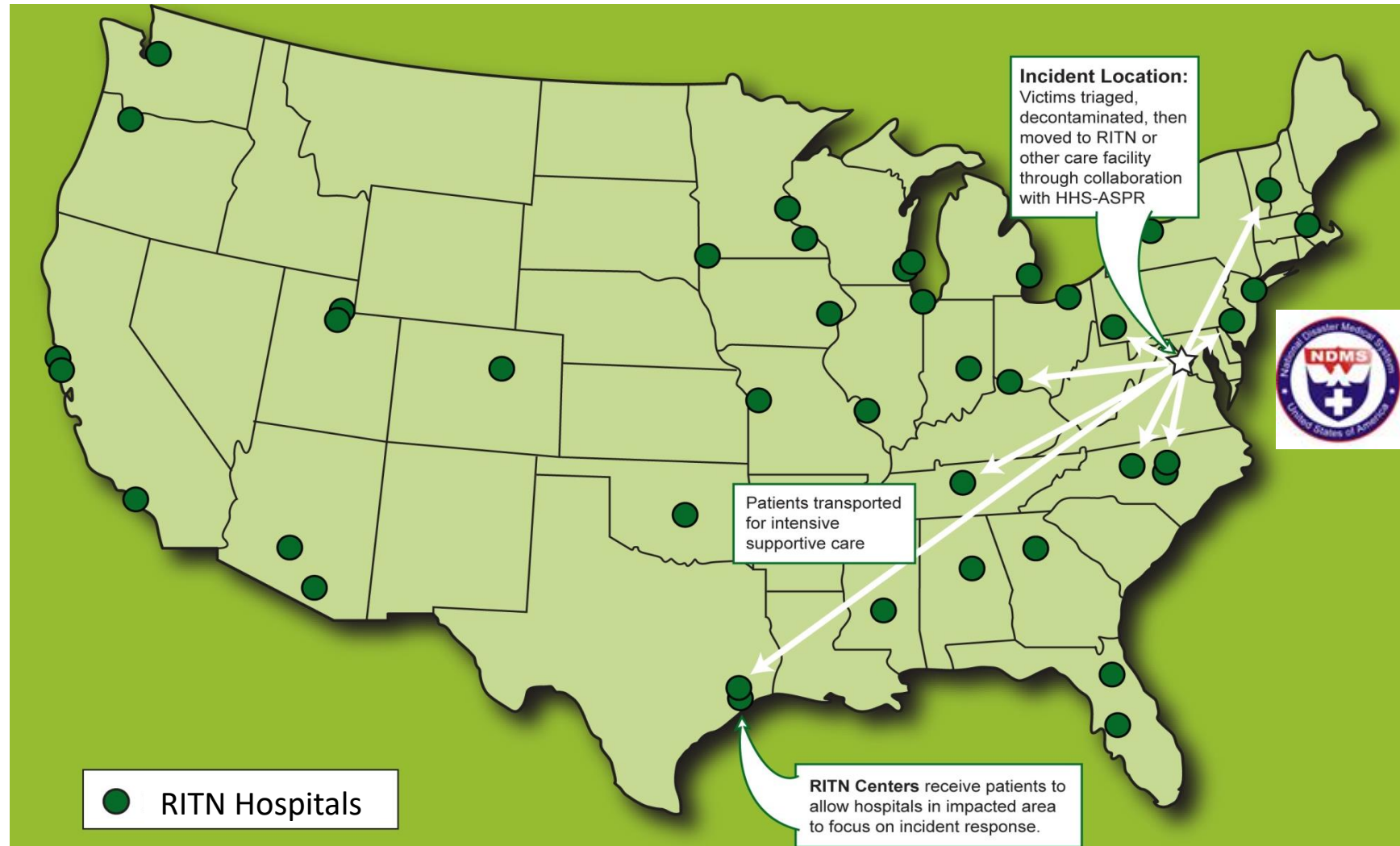


Illustration from: Knebel AR, Coleman CN, Cliffer KD; et al. Allocation of scarce resources after a nuclear detonation: setting the context. Disaster Med Public Health Prep. 2011;5 (Suppl 1):S20-S31

Proximity Will Not Preclude Involvement

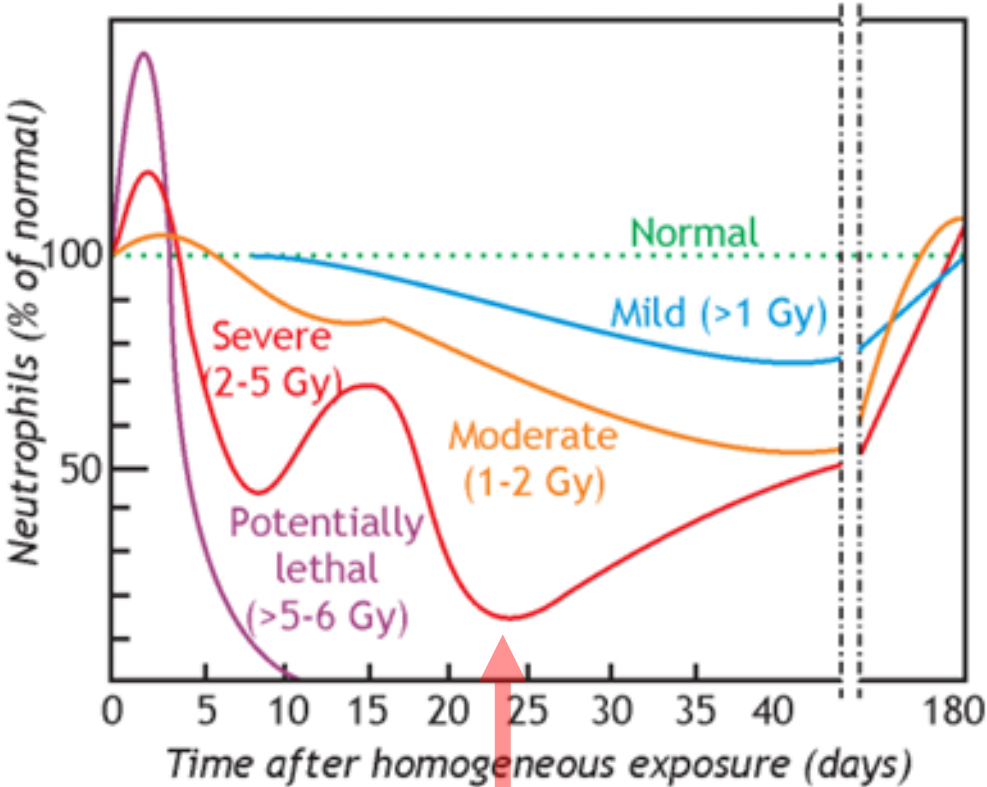


ARS Is Complicated - But There Is Time

Trivia Geek:
2x4 Rule

Dose (Gy)	12 and above	↑ Bone Marrow Suppression	Neurovascular syndrome onset	Multiple organ failure Probable death
	11			
	10			Consider stem cell transplants
	9			
	8			
	7			LD50/60 with supportive care
	6		GI syndrome onset	
	5			LD50/60 without treatment
	4			
	3			
	2		Hematopoietic syndrome onset	~100% survival without treatment ★
	1			
	0			

From: Medical Management of Radiological Casualties (Fourth Edition – July 2013) Military Medical Operations, Armed Forces Radiobiology Research Institute, Bethesda, Maryland 20889-5603 <https://www.usuhs.edu/afri/productsandpublications> accessed 11/29/16

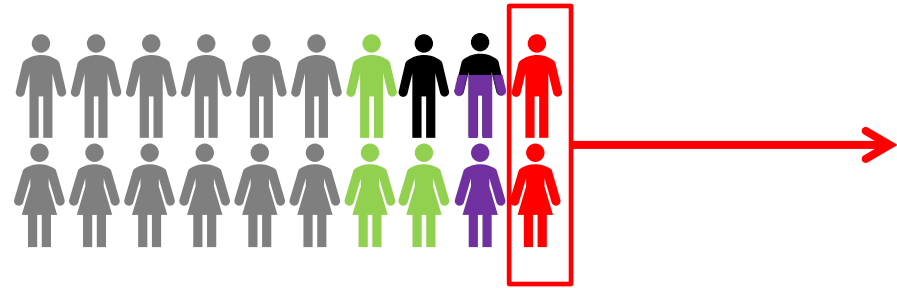


From: EBMT Pocket Guide October 2017 - European approach for the Medical Management of Mass Radiation Exposure Therapeutical Management



RITN Estimated Patient Profile

Total IND Casualties: 588,000



60%
of casualties will have **trauma only**

10%
of casualties will have **moderate to severe radiation only injuries (ARS)** & be sent to RITN hospitals for definitive medical care

8%
of casualties will be triaged as expectant due to **severe ARS**




15%
of casualties will have **mild ARS** & only need to be monitored

7%
of casualties will have **combined trauma & radiation injuries** and need to be stabilized before involving RITN

Expected Patient Care Requirements for RITN Patients

Breakdown of Expected Radiation Only Casualties for RITN Hospitals

Breakdown of estimated casualties

 1% Marrow transplant candidates	630
 29% Intensive inpatient supportive care	18,270
 70% Outpatient complete blood count monitoring	44,100

*based on estimates from:

Knebel AR, Coleman CN, Cliffer KD; et al. Allocation of scarce resources after a nuclear detonation: setting the context. Disaster Med Public Health Prep. 2011;5 (Suppl 1):S20-S31



Resources

Federal Plans Involving RITN

- White House: Planning Guidance for Response to a Nuclear Detonation
- FEMA: Nuclear/Radiological Incident Annex
- ASPR: Radiological Dispersal Device Playbook
- ASPR: Rad/Nuke Annex to All Hazards Plan
- ASPR: State & Local Planners Playbook for Medical Response to a Nuclear Detonation
- ASPR: Medical Planning and Response Manual for a Nuclear Detonation Incident
- NLM: REMM-RITN Prototype for Adult & Pediatric Medical Orders During a Radiation Incident



FEMA



Some Resources

- Treatment Guidelines & medical orders: www.RITN.net/treatment
- Referral Guidelines: www.RITN.net/triage
- Cytokine Triage Guidelines: www.RITN.net/triage
- Exercise Materials: www.RITN.net/exercises
- Training: www.RITN.net/training
- RITN YouTube Channel: <https://www.youtube.com/channel/UCkd45X1DlPqeRr-u5lph6Og>
- RITN Resources Incorporated in REACT/TS App
- Medical Orders & Dosimetry:
 - www.REMM.HHS.gov & REMM App
- Dosimetry: Mobile FRAT app (Google Play or AFRRI)





RITN Acute Radiation Syndrome Treatment Guidelines

Table of Contents

Principles of ARS management at RITN centers	Page 2
Crisis standards after a nuclear detonation	Page 5
Acute Radiation Syndrome (ARS)	Page 9
Casualty triage after a nuclear detonation	Page 11
ARS management	Page 23
Stem cell support: when to HLA type casualties	Page 25
Additional Resources	Page 28





Guidelines for Identifying Radiation Injury and Considering Transfer to a Specialized Facility

Purpose: to provide hospitals with a concise guide for identifying casualties in the aftermath of a radiation incident who may have received a clinically significant dose of radiation.

Regional RITN hospital contact information for specialized consultation:

Hospital Name:

Department:

Phone:

E-mail:

Overview: Ionizing radiation affects the hematopoietic system even at very low doses; hematology and oncology medical staff treat these effects daily. Irradiated patients may develop severe organ dysfunction over time and require intense and specialized management.

For extensive information on the acute radiation syndrome (hematologic, gastrointestinal, cutaneous, central nervous system), types of radiation incidents, and radiation decontamination, see: www.remm.nlm.gov (Radiation Emergency Medical Management (REMM) website)

CONSULTATION/REFERRAL CRITERIA: Any patient suspected of having a radiation injury can be discussed with your local RITN center. The ability to accept referrals will depend on the size of the incident and the capacity of regional RITN center(s).

a. Criteria for considering RITN center consultation/referral include:

- i. Absolute neutrophil count less than 1,000/ μ L
- ii. Absolute lymphocyte count less than 1,000/ μ L
- iii. Severe nausea, vomiting and/or anorexia
- iv. A localized cutaneous radiation injury that requires extensive management
- v. Suspected or known internal contamination (e.g. involving a wound, the lung or GI tract)
- vi. Current facility not equipped to provide irradiated, leukoreduced blood products

b. Manage comorbidities and possible sequelae of irradiation:

- i. See www.ritn.net/Treatment/ for acute radiation syndrome treatment guidelines:

1. Transfuse only irradiated and leukocyte depleted blood products

Cytokine Triage Guidelines: www.RITN.net/triage

Radiation Injury Treatment Network

CYTOKINE ADMINISTRATION TRIAGE GUIDELINES FOR ACUTE RADIATION SYNDROME (ADULT & PEDIATRIC)
For use in the immediate aftermath of a radiological disaster with mass casualties. These triage guidelines assume constrained resources.



ASSESS ESTIMATED WHOLE BODY ABSORBED DOSE						
Absolute Assessment of Lymphocyte Count x10 ⁹ cells/L			Assess Time to Vomiting	Est. Whole Body Rad Dose Range (Gray)	Treatment Category	Treatment Notes
Time since initial radiation exposure						
24 Hours	96 Hours	192 Hours				
> 1.90	> 0.89	> 0.33	> 5 hrs	< 2	Release and monitor	
1.48 - 1.90	0.33 - 0.89	0.044 - 0.33	1 – 2 hrs	2 – 4	Myeloid Cytokine & Supportive Care	Iterative Clinical & Lab Assessment
1.15 – 1.48	0.12 - 0.33	0.006 - 0.044	2 – 5 hrs	4 - 6		
0.89 - 1.15	0.044 - 0.12	< 0.001 - 0.006	< 1 hrs	6 – 8		Provide comfort care where feasible Re-evaluate based on available resources
< 0.89	< 0.044	< 0.0001	< 1 hrs	8+		

CYTOKINE DOSING GUIDANCE normal supply availability			
	Neupogen (Filgrastim)	Neulasta (Pegfilgrastim)	Leukine (Sargramostim)
Adult	10 mcg/kg/day subcutaneous	6 mg subcutaneously (Two doses one week apart)	7 mcg/kg subcutaneous
Pediatric	10 mcg/kg/day subcutaneous	31 - 44 kg 4 mg subcutaneous 21 - 30 kg 2.5 mg 10 - 20 kg 1.5 mg < 10 kg = 0.1 mg/kg	7 mcg/kg subcutaneous
Packaging	300 mcg/0.5 mL 480 mcg/0.8 mL	6 mg/0.6 mL	Vial: 500 mcg per mL in multiple-dose vial

- Cytokine Administration Triage Guidelines for Acute Radiation Syndrome (Adult and Pediatric)
- Sizes to download:
 - 4"x6"
 - 8.5" x 11"
 - 24" x 36"



Annual RITN Tabletop Exercises

[Expand All](#) [Collapse All](#)

2022 Tabletop Exercises

- [2022 RITN Annual TTX Situation Manual](#) (PDF)
- [2022 RITN Annual TTX AAR - Session 2 Jul12](#) (PDF)
- [2022 RITN Annual TTX AAR - Session 3 Jul19](#) (PDF)
- [2022 RITN Annual TTX AAR - Session 4 Jul20](#) (PDF)
- [2022 RITN Annual TTX AAR - Session 1 Jun28](#) (PDF)
- [2022 RITN Annual TTX AAR - Session 5 Aug17](#) (PDF)
- [2022 RITN Annual TTX AAR - Session 6 Aug25](#) (PDF)
- [2022 RITN Annual TTX AAR Summary Report](#) (PDF)

2021 Tabletop Exercise

- [2021 RITN Annual TTX SitMan](#) (PDF)
- [2021 RITN Annual TTX AAR](#) (PDF)

2020 Tabletop Exercises

There were no Tabletop Exercises for 2020

RITN Sponsored Exercises

[Expand All](#) [Collapse All](#)

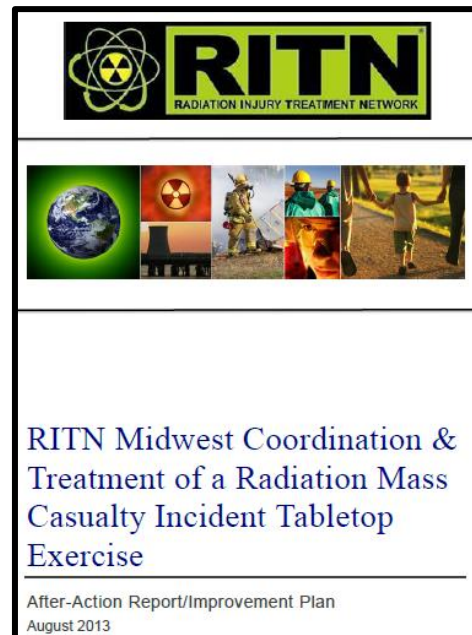
2022 Sponsored Exercises

- [2022 RITN IL Reg 10 WS SitMan](#) (PDF)
 - [2022 RITN IL Reg 8-9 FE AAR](#) (PDF)
 - [2022 RITN IL Reg 8-9 FE C&E Briefing](#) (PDF)
 - [2022 RITN TN Highland Rim HCC WS AAR](#) (PDF)
 - [2022 RITN TN Highland Rim HCC WS SitMan](#) (PDF)
- ### 2021 Sponsored Exercises
- [2021 RITN Grady-Emory Lab Surge TTX AAR](#) (PDF)
- ### 2020 Sponsored Exercises
- [2020 RITN IL Reg 8 Medical Response WS](#) (PDF)
 - [2020 RITN IL Reg 8 Medical Response WS AAR](#) (PDF)

Exercise Archives

[Expand All](#) [Collapse All](#)

- + 2019
- + 2018
- + 2017
- + 2016
- + 2015
- + 2014
- + 2013
- + 2012
- + 2011
- + 2010
- + 2009
- + 2008
- + 2007
- + 2006



TTX, Functional & Full-scale Exercises



Radiation Based Functional Exercise Toolkit

- **Healthcare Coalition functional exercise toolkit**

- **Exercise purpose:**

- Address the operational elements of the receipt, triage, and care of radiation-injury and acute blast/burn injury casualties in accordance with existing Health Care Coalition and individual hospital/agency plans.

- **Scope:**

- Functional elements minimally include activation of command, notifications, and patient triage. Optional injects will exercise decontamination, pharmacy resources, patient transfer, and just-in-time training needs. Participants will include Health Care Coalition partners and relevant federal partners. The exercise is not limited to jurisdictions that have a RITN hospital.

- <https://ritn.net/exercises/hccfunctional/>

HCC Exercise Materials

Provided:

1. Exercise Plan (just a comment placeholder for video link)
2. AAR template
3. Exercise slides without audio (in the event a HCC wants to customize the content)
4. Patient profiles
 1. Burn trauma
 2. General trauma (blast and crush) with radiation exposure
 3. Spontaneous/self transport family
 4. Radiation-only profiles
5. MSEL
6. Patient manifests



Medical Response to Radiation Exposure: the Role of Hematologists

Rev. Feb 2022

Agenda

- Radiation Injury Treatment Network
- Radiological Event Scenarios
- Radiation Biology
- Dosimetry
- Acute Radiation Syndrome
- Mitigation and Treatment
- Available resources

2

RITN Radiation Grand Rounds

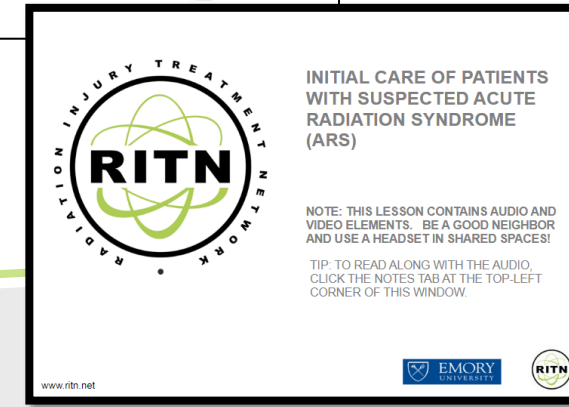
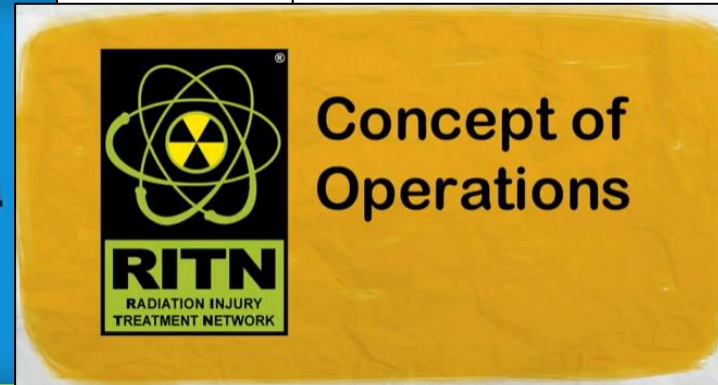
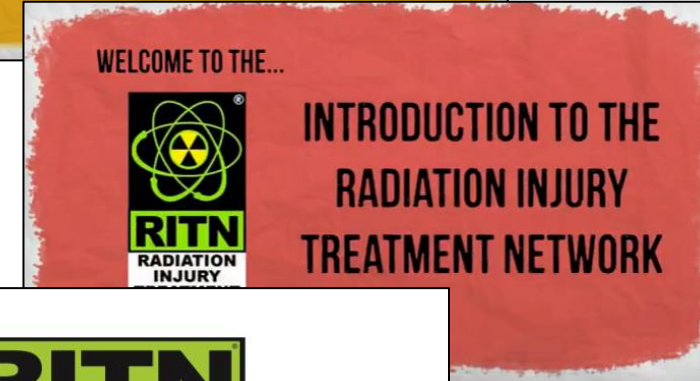
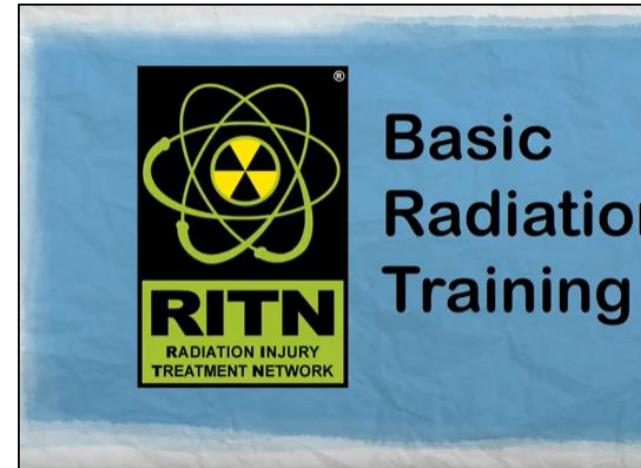
Rev. Feb 2022




Web Based Training: www.RITN.net/training (FREE TRAINING)

- Web based training
 - Intro to RITN
 - Basic Radiation Training
 - RITN Concept of Operations
 - Radiation Safety Communication
 - GETS Card 101
 - Initial Care of Patients with Suspected ARS
 - Non-Medical Radiation Awareness Training (ESL)
- Medical Grand Rounds training


Adopted by NNSA
for USAID training





Radiation Injury Treatment Network
 14 subscribers

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RITN What You Need To Know
 668 views • 1 year ago
 Radiation Injury Treatment Network (RITN) overview video



8:14
 PREVIEW
 RITN Just In Time Training - Before a Radiological Emergenc...



8:37
 PREVIEW
 RITN Just In Time Training - What to Expect: Does the Patie...



6:42
 PREVIEW
 RITN Just In Time Training - Am I Safe Treating ARS Patients?

Uploads [PLAY ALL](#)



16:11
 Emory RITN JIT ARS Training May 30 2017



5:58
 Philly Special RadEx
 23 views • 2 weeks ago




16:48
 RITN-Wake Forest Baptist Health Exercise 2015



2:25
 RITN-City of Hope Exercise 2016




4:09
 Emory Operation Gateway Radiation Response Exercis...



RITN
 RADIATION INJURY
 TREATMENT NETWORK

-Fortuna Favet Paratis-

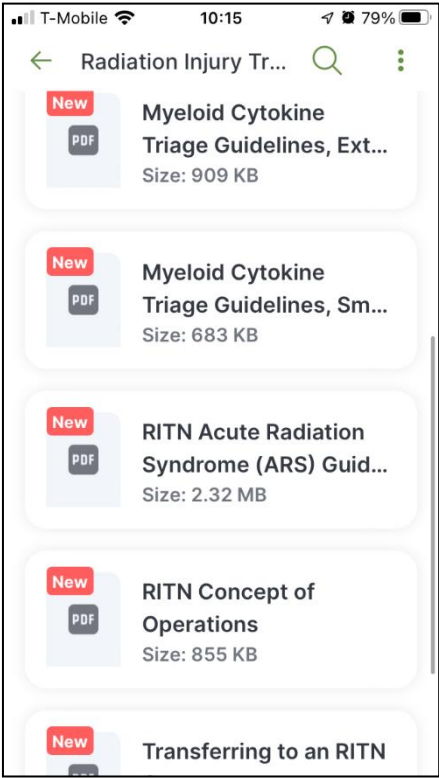
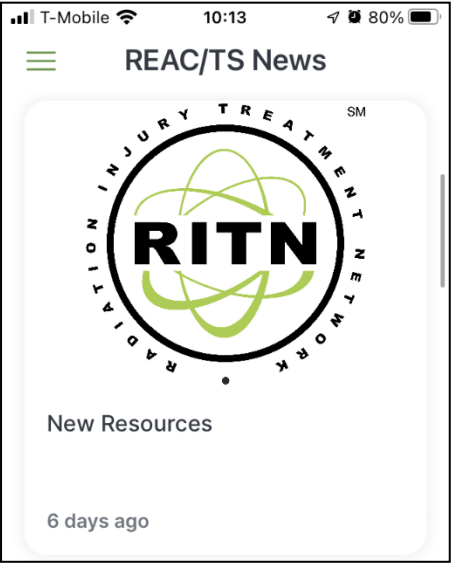
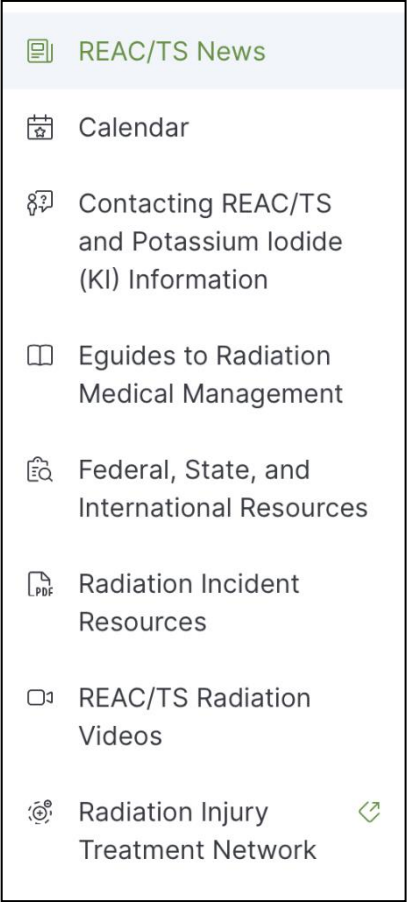
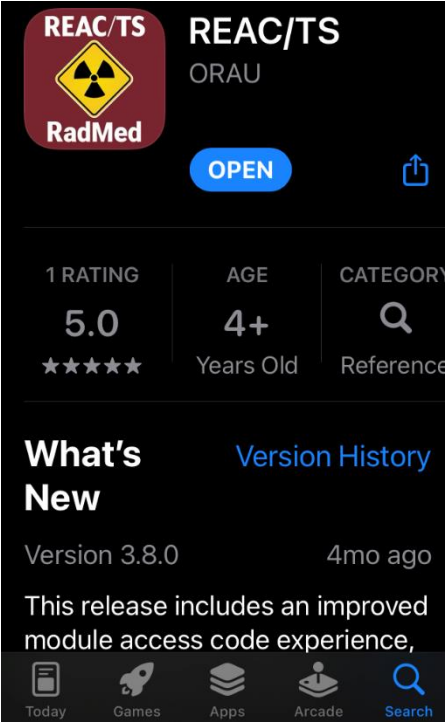
Just In Time Training Module: Primer for Healthcare Providers



EMORY UNIVERSITY

Course material developed by Emory University in partnership with the Radiation Injury Treatment Network.

RITN Resources Incorporated in REACT/TS App



Adult Medical Orders

REMM
Prototype / Template for
Adult Hospital Orders
During a Radiation Emergency
Version: Jan 25, 2019

Cautions

- Authored by [REMM](#) and [RITN](#) physicians, this set of orders is a prototype only.
- **Orders must be customized for each patient and incident.**
- Specific drugs are suggested for function only. Patients may not need any/every category of drug listed.
- No HHS, CDC, FDA, or other US government entity endorsement of specific drugs or drug doses is intended or implied by inclusion in this order set.
- Consult the notes at the end of this document for additional, key information.

Internal contamination (decorporation treatments)

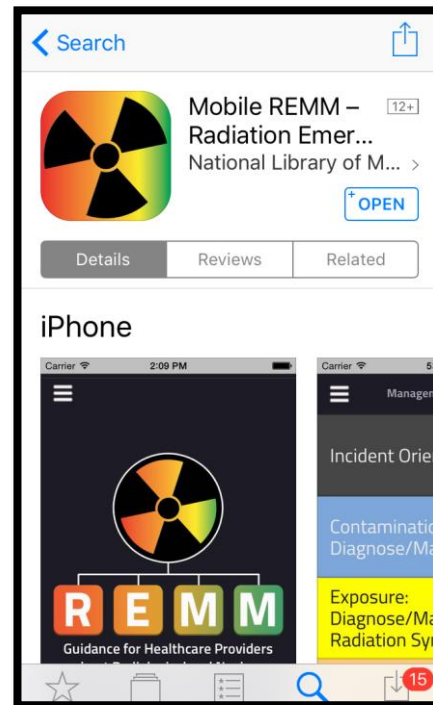
- This **Adult Orders Prototype** lists only FDA-approved medications as radioisotope countermeasures.
- Some, but not all of these drugs are currently in the [Strategic National Stockpile](#).
- Prescribers should consult the FDA drug label for complete prescribing information.
- Decorporation drugs should be used in children and pregnant women with great caution.
- The online version of REMM has additional recommendations about [additional countermeasure drugs that may be considered](#).
- This prototype does **not** address threshold levels of [internal contamination](#) that would trigger initiation, continuation, or discontinuation of decorporation treatment.
- See [REMM Countermeasures Caution and Comment](#), which discusses this issue.

Drug dosages

- All adult drug doses in this prototype are based on a 70 kg adult with normal renal and hepatic function.
- Appropriate dose adjustments should be made based on age, weight, drug-drug interactions, nutritional status, renal, and hepatic function.



www.REMM.HHS.gov



Pediatric Medical Orders

REMM
Prototype / Template for
Pediatric Hospital Orders
During a Radiation Emergency
Version: Jan 25, 2019

Cautions

- Authored by [REMM](#) and [RITN](#) physicians, this set of orders is a prototype only.
- **Orders must be customized for each patient and incident.**
- Specific drugs are suggested for function only. Patients may not need any/every category of drug listed.
- No HHS, CDC, FDA, or other US government entity endorsement of specific drugs or drug doses is intended or implied by inclusion in this order set.
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Internal contamination (decorporation treatments)

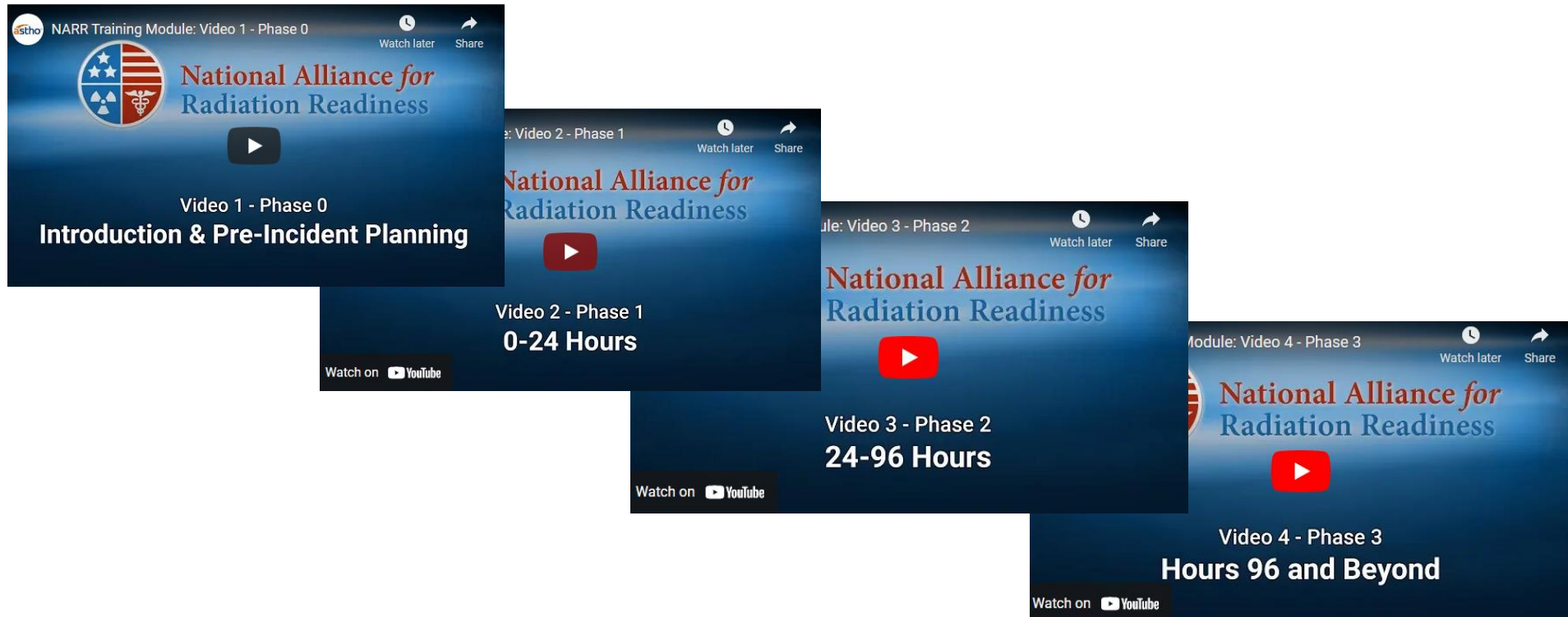
- This **Pediatric Orders Prototype** lists only FDA-approved medications as radioisotope countermeasures.
- Some, but not all of these drugs are currently in the [Strategic National Stockpile](#).
- Prescribers should consult the FDA drug label for complete prescribing information.
- Decorporation drugs should be used in children and pregnant women with great caution.
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- This prototype does **not** address threshold levels of [internal contamination](#) that would trigger initiation, continuation, or discontinuation of decorporation treatment.
- See [REMM Countermeasures Caution and Comment](#), which discusses this issue.

Drug dosages

- All drug doses in this prototype should be customized for each patient.
- All pediatric drug doses should be prescribed as appropriate for **age, weight, and any clinical issues**, including allergies.
- Appropriate dose adjustments should be made based on age, weight, drug-drug interactions, nutritional status, renal, hepatic function, and risk/benefit calculus.

Training for New to Public Health Preparedness Staff

- RITN.net/Training
- National Alliance for Radiation Readiness Radiation Training Modules for Public Health
 - <https://www.radiationready.org/posted-tools/national-alliance-for-radiation-readiness-radiation-training-modules-for-public-health/>



Takeaways

- **RITN takeaways:**
 - Distant response
 - Integrates with NDMS
 - Cancer treatment centers = ARS only but will consult with trauma/burn centers on combined injury care
- **Remember: 2 x 4 rule & 7:10 rule**
 - 7:10 rule = “For every sevenfold increase in time after detonation, there is a tenfold decrease in the radiation rate.”; @ 7 hours there is 1/10 of radiation is left (7 hours=10%, 2 days=1%, 2 weeks=0.1%)
 - 2x4 rule=rough estimate of dose if vomiting at 2 hours is >4 Gy exposure if vomiting at 4 hours is a <2 Gy
- **Response takeaways:**
 - **Distance will not prevent involvement** in the response
 - **Injuries will be complicated:** Combined trauma and radiation significantly decreases survivability
 - **Dose estimates will be unclear**
 - Most research on treatment and outcomes is based on whole body dose
 - Most will likely have partial body exposures
 - **Triage will be essential** for scarce resource allocation
 - Medical countermeasures will help but not likely enough for everyone
 - Many with low doses can be sent home or outpatient (daily CBC+diff)
 - **Difficult decisions will have to be made** on who to prioritize; the closer to the disaster the messier it will be

Partners



National Institute of Allergy and Infectious Diseases (NIAID), Radiation and Nuclear Countermeasures Development Program (RNCP)



Questions



Thank you!



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www.rdhhs.org

www.massgeneral.org/disaster-medicine



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