

Development of Population Protective Procedures for a Radiological Event

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Introduction

Radiological hazards pose a great threat to the general public as well as the environment. Radiation is a process where energy is emitted by an object in the form of waves or particles that travel through a medium (air, water, etc.) (Wodarz, Sorace, & Komarova, 2014). The potential for radiation to be utilized as a weapon of mass destruction (WMD) is a relevant and serious threat to public health (Table 1).

This study sought to evaluate the overall preparedness of first response agencies across the west central Ohio region for a large-scale nuclear incident and the proper procedures to monitor populations during a radiological event.

Table 1. 50 percent fatality rate expected according to the size of a nuclear weapon (Mettler and Voelz, 2002).

Yield (kilotons)	Shock Wave (meters)	Thermal Radiation (meters)	Ionizing Radiation	
			(initial)	(residual)
0.01 kt	60	60	250	1270
0.1 kt	130	200	460	2750
1 kt	275	610	790	5500
10 kt	590	1800	1200	9600

Methods

West Central Ohio Radiological Exercise

- 28 players involved (public health, law enforcement, fire/EMS, hospitals, long-term care facilities & non-governmental orgs.)
- 6 public health preparedness capabilities tested
- Master sequence of event listing (MSEL) utilized injects to complete required objectives
- Exercise evaluation guidelines (EEGs) measured whether applicable objectives were met

Medical Reserve Corps Community Reception Center

- 38 medical reserve corps (MRC) volunteers to play as community reception center (CRC) attendees or as CRC staff at the National Center for Medical Readiness
- CRC established to follow Centers for Disease Control and Prevention (CDC) guidelines for triage and station establishment (Figure 1)
- EEGs measured whether applicable objectives were met

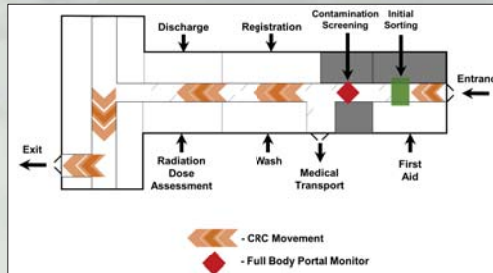


Figure 1. Diagram of Medical Reserve Corps community reception center at the National Center for Medical Readiness.

Results & Conclusions

West Central Ohio Radiological Exercise

- Regional radiological plan properly coordinated with various first response agencies
- Strong demonstration of incident command structure (ICS)
- Communication needed to improve among agencies
- Identify necessary resources available from partners

Medical Reserve Corps Community Reception Center

- Volunteers willing to learn about CRC concept
- CRC stations need additional roles to be clarified
- Job action sheets need clarification for CRC staff
- Establish pet friendly protocols
- Increase training opportunities with volunteers for radiation

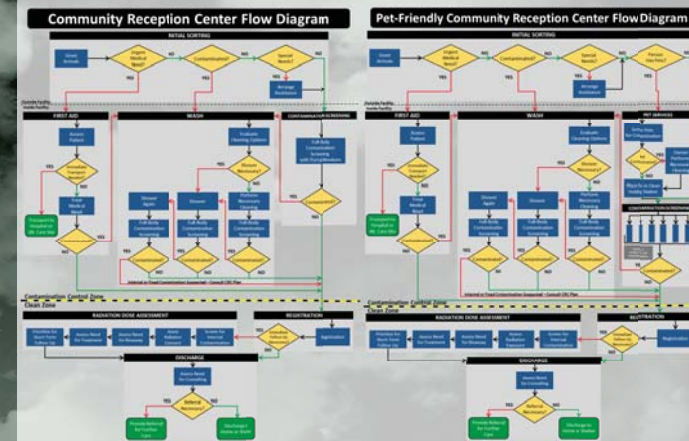


Figure 2. (Left) Proposed community reception center flow diagram for Public Health – Dayton and Montgomery County. Figure 3. (Right) Proposed pet-friendly community reception center flow diagram for Public Health – Dayton and Montgomery County.

References

- Mettler, F. A., & Voelz, G. L. (2002). Major radiation exposure- what to expect and how to respond. *New England Journal of Medicine*, 346(20), 1554-1561. doi:10.1056/NEJMra000365
- Wodarz, D., Sorace, R., & Komarova, N. L. (2014). Dynamics of cellular responses to radiation. *PLoS Computational Biology*, 10(4), 1-11. doi:10.1371/journal.pcbi.1003513

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