

# **Hospital Response to Mass Casualties from a Radiological Incident**

***National Perspectives On Emergency Management  
– A Capitol Concept, Washington, D.C., May 3-5,  
2004***

**James M. Smith, Armin Ansari and Marie  
Spano**

**Division of Environmental Hazards and Health  
Effects, CDC, Atlanta, Georgia**



# Guidelines on Medical and Hospital Preparedness and Response

- **NATO Handbook on the Medical Aspects of NBC Defensive Operations AMedP-6(B); Annex C (1996)** [www.vnh.org](http://www.vnh.org)
- **Radiation Emergency Assistance Center/Training Site (REAC/TS) Guidance for Radiation Accident Management** [www.ornl.gov/reacts/guidance.htm](http://www.ornl.gov/reacts/guidance.htm)
- **AFRRI Medical Management of Radiological Casualties: Handbook (Second Edition, 2003)** [www.afrri.usuhs.mil](http://www.afrri.usuhs.mil)

# **Guidelines on Medical and Hospital Preparedness and Response (cont.)**

- **Management of Terrorist Events Involving Radioactive Material (NCRP Report 138, 2001); Management of Persons Accidentally Contaminated with Radionuclides (NCRP Report 65, 1980)**
- **Department of Homeland Security Working Group on Radiological Dispersal Device (RDD) Preparedness: Medical Preparedness and Response Sub-Group (2003)**  
**[www.bt.cdc.gov/radiation/index.asp](http://www.bt.cdc.gov/radiation/index.asp)**

# Guidelines on Medical and Hospital Preparedness and Response (cont.)

- **Disaster Preparedness for Radiology Professionals: Response to Radiological Terrorism (American College of Radiology with American Society for Therapeutic Radiology and Oncology and AAPM) (Version 2.1, 2003)**  
[www.acr.org](http://www.acr.org)
- **CDC Interim Guidelines for Hospital Response to Mass Casualties from a Radiological Incident (2003)** [www.bt.cdc.gov/radiation/index.asp](http://www.bt.cdc.gov/radiation/index.asp)

# Topics from Guidelines and Handbooks

- Triage
- Patient Management and Treatment
- Radiological Monitoring and Dose Assessment
- Contamination Containment and Control
- Communication
- Psychosocial and Mental Health Issues (Patients *and* Staff)

# **Topics from Guidelines and Handbooks (cont.)**

- **Health Care Provider Protection**
- **Training and Exercises**
- **Hospital Preparedness and Planning**
- **Federal, State and Local Assistance**
- **Resources**

# The First 100 Minutes



# How do first disaster victims arrive at hospitals?

- **Murrah Federal Building, Oklahoma City, 1995 (400 treated)**
  - **Ambulance 33%; Private vehicles 56%; Walk-ins 10%**  
(Annals of Emergency Medicine, 34(2): 160-167, 1999)
- **Sarin Attack, Tokyo, 1995 (4,000 treated)**
  - **Walk-ins 35%; Taxi 24%; Private vehicles 13%; Fire/Police 14%; ambulance 7%**  
(Academic Emergency Medicine, 5(6): 613-617, 1998)

# **What are immediate issues facing the hospital as victims begin arriving?**

- **Triage**
- **Personal decontamination**
- **Medical management of life-threatening injuries or illness**
- **Health care provider safety & health**
- **Surge capacity: availability of staff (quantity & specialists), supplies, space**

# **Commitment to Help in Field Medical Facilities (Disasters or WMD Event)**

	<b>Physician</b>	<b>Nurse</b>
<b>Natural Disaster</b>	<b>83 %</b>	<b>90 %</b>
<b>Explosion Incident</b>	<b>67 %</b>	<b>70 %</b>
<b>Chemical Incident</b>	<b>59 %</b>	<b>59 %</b>
<b>Biological Incident</b>	<b>56 %</b>	<b>53 %</b>
<b>Contagious Epidemic</b>	<b>56 %</b>	<b>49 %</b>
<b>Radiological Incident</b>	<b>52 %</b>	<b>45 %</b>

**Source: Hawaii Medical Professionals Assessment (Lanzilotti, 2002)**

# Noble Training Center (Anniston, AL) Mock Training Exercise





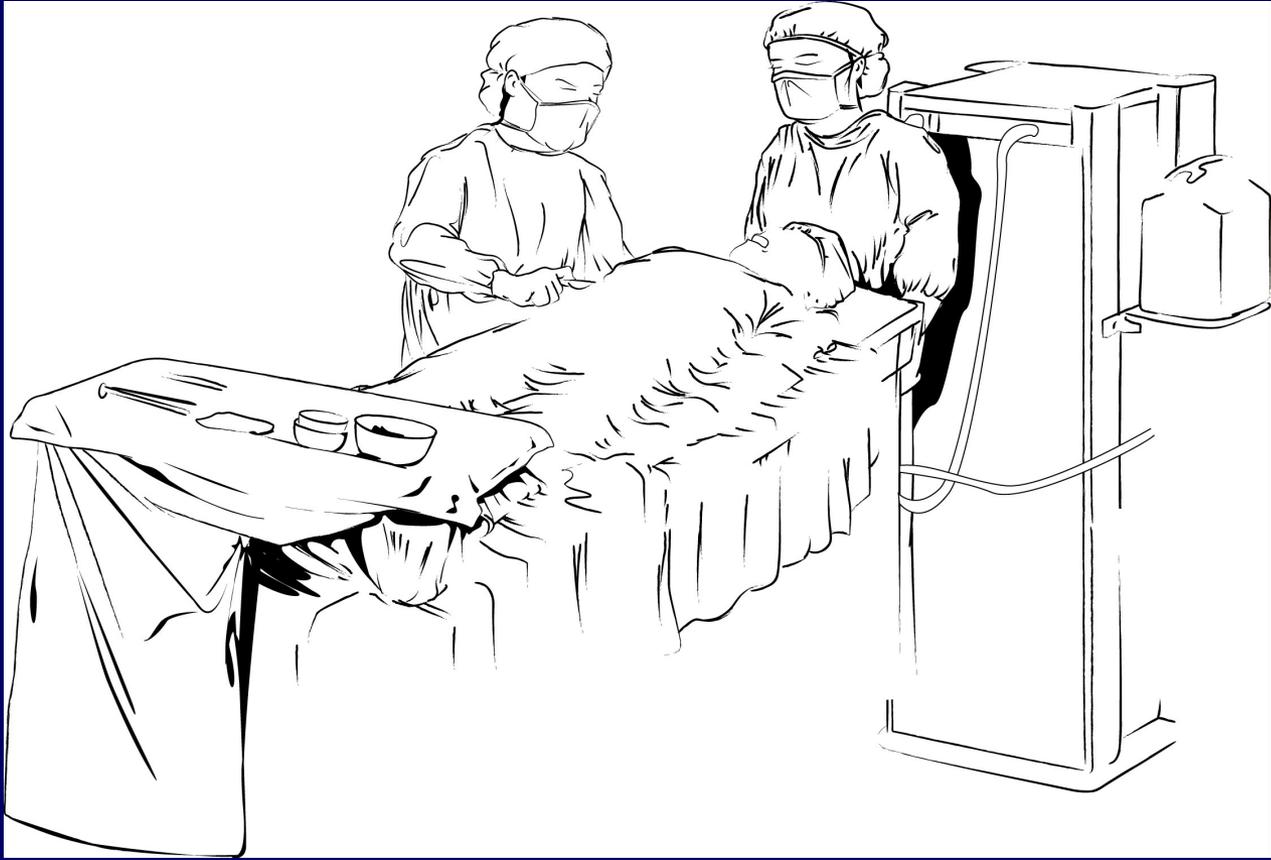
# **Radiological Medical Response**

**Treatment of life-threatening injuries should never be delayed to address radioactive contamination or exposure. Medical stabilization of the patient is the first priority.**

# Chemical/Biological Medical Response

“Patients requiring additional medical attention . . . or other emergency treatment, may receive that care during or after the decontamination process depending on the severity of the agents’ effects . . . .”

*From Chemical and Biological Terrorism: Research and Development to Improve Civilian Medical Response, Institute of Medicine, 1999*



# Time of Continuous Exposure Corresponding to Dose Guidelines Victim Externally Contaminated ( $10 \mu\text{Ci}/\text{cm}^2$ )

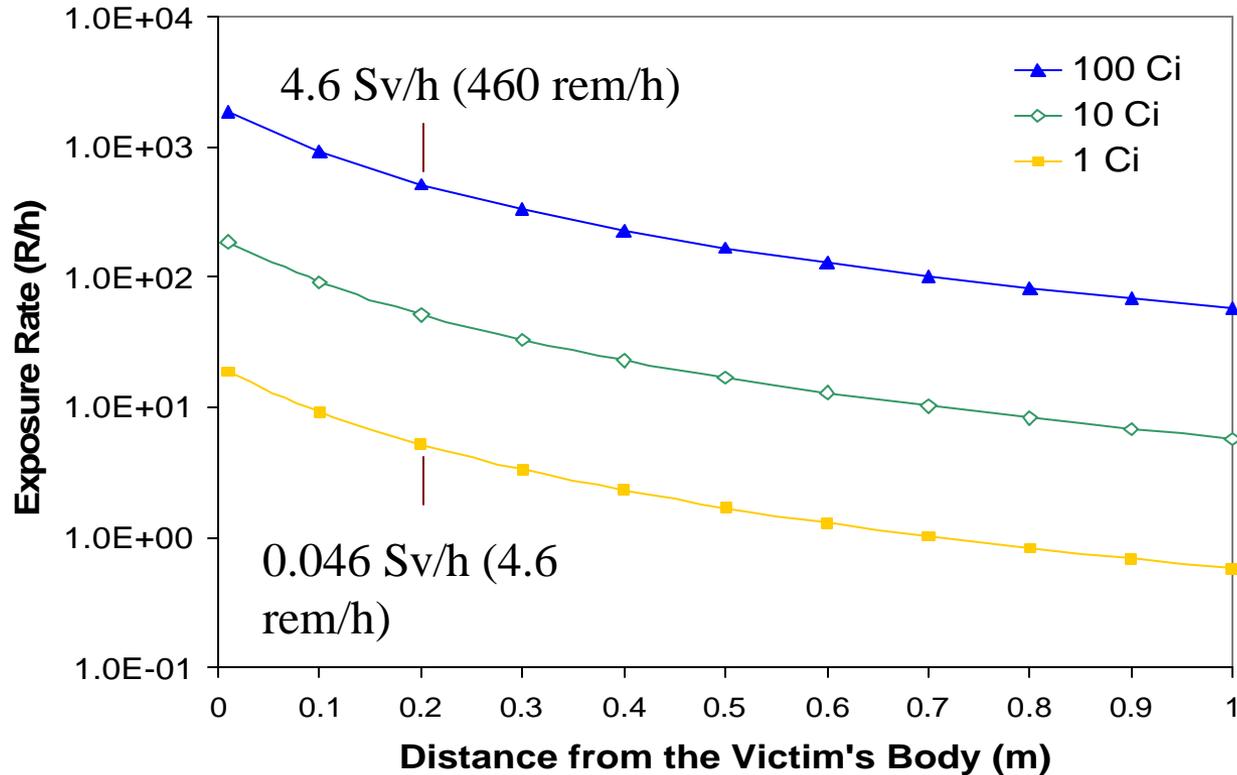
Radionuclide ( $10 \mu\text{Ci}/\text{cm}^2$ )	Hours of Exposure <sup>a</sup> Necessary to Reach the Following Dose Guidelines			
	250 mSv <sup>b</sup> (25 rem)	50 mSv <sup>c</sup> (5 rem)	5 mSv <sup>d</sup> (500 mrem)	1 mSv <sup>e</sup> (100 mrem)
<b>Co-60</b>	38	7.6	0.76	0.15
<b>Ir-192</b>	98	20	2.0	0.39
<b>Cs-137</b>	150	30	3.0	0.60
<b>Am-241</b>	2660	530	53	11

## **Additional Potential Problems:**

- **Metallic fragmentation and shrapnel**
- **Beta Emitters (Sr-90/Y-90)**

# Exposure Rate (R/h)

## From an Embedded Co-60 Fragment



# Managing Mass Radiological Casualties

- While guidance is available, possible exceptions exist !
- Sound judgment will *always* plays vital role

# Challenge to Community of Radiation Experts

*For health care providers and first responders:*

- **Initiate open dialogue and an active educational campaign about medical response to radiation emergencies**
- **Take a giant step forward in providing training opportunities**

**Are health care providers interested in nuclear/radiological emergency response?**

# CDC Satellite Educational Programming

*Top Two in Live Viewer Participation*

	<b>Satellite Broadcast Viewers</b>	<b>Worldwide Web Viewers</b>
<b>Preventing Spread of SARS (4/4/03)</b>	<b>39,414</b>	<b>2,447</b>
<b>Medical Response to Nuclear/Rad Terrorism( 2/10/04)</b>	<b>24,645</b>	<b>2,885</b>

**Thank You!**

