

MODULE 5

Radiation and Nuclear Emergencies

RDD, Acute Radiation Syndrome, and Countermeasures

Bioterrorism Preparedness for Nevada Nurses

4.0 Contact Hours | Nevada Board of Nursing Approved

Provider: NV-14175 | NAC 632.340 & NAC 632.355

Learning Objectives

1	Differentiate RDD (dirty bomb) from nuclear detonation
2	Recognize phases of Acute Radiation Syndrome (ARS)
3	Implement radiological decontamination procedures
4	Administer appropriate radiation countermeasures

Radiological Dispersal Device (RDD)

Dirty Bomb

What it is: Conventional explosive + radioactive material

Primary goal: PANIC and economic disruption

Primary injuries: From the BLAST, not radiation

Radiation exposure: Typically low-level

■ CRITICAL PRIORITIES

1. TREAT LIFE-THREATENING TRAUMA FIRST - radiation injuries are NOT immediately life-threatening
2. DECONTAMINATE - remove all clothing (eliminates most contamination)
3. COUNTERMEASURES if internal contamination confirmed

Acute Radiation Syndrome (ARS)

Occurs after large whole-body doses (typically nuclear detonation, NOT dirty bombs):

Phase	Timeline	Manifestations
Prodromal	Hours to days	Nausea, vomiting, diarrhea - severity predicts dose
Latent	Days to weeks	Symptom-free period ('walking ghost' phase)
Manifest Illness	Weeks	Bone marrow suppression, GI failure, CV collapse
Recovery/Death	Weeks to months	Outcome depends on dose and treatment

KEY POINT

Patient is NOT radioactive and NOT contagious once externally decontaminated!

Radiation Countermeasures

Radionuclide	Countermeasure	Mechanism
Radioactive Iodine (I-131)	Potassium Iodide (KI)	Blocks thyroid uptake
Cesium-137	Prussian Blue	Binds cesium in GI tract
Plutonium, Americium	Ca-DTPA or Zn-DTPA	Chelating agent - enhances excretion

- ✓ Dirty bombs cause blast injuries primarily; radiation exposure is usually low
- ✓ TREAT TRAUMA FIRST - radiation injuries are not immediately life-threatening
- ✓ ARS phases: Prodromal → Latent → Manifest → Recovery/Death
- ✓ Externally decontaminated patients are NOT radioactive