

Managing Patients After a Nuclear Detonation

Emergency Department Personnel

Key Initial issues

Immediate Protective Actions for Everyone after Nuclear Detonation

- **Get inside:** Building interiors and basements provide the greatest protection.
- **Stay inside:** This minimizes exposure to fallout and other environmental hazards. Be prepared to shelter for 12-24 hours if the facility could be in the fallout area.
- **Stay tuned:** Emergency Alert System/Response Managers will update instructions.

Protecting Health Care Providers

- **For managing patients potentially or known contaminated with radiation:** gown, gloves, boots, eye protection, and surgical mask or N95 as appropriate.
- **For managing patients exposed but NOT contaminated:** standard precautions, if appropriate for traumatic injury.
- **For yourself:** Wear a personal dosimeter if assigned one or monitor background radiation and know your dose limits. Coordinate with nuclear medicine/radiation safety personnel.

Management Priorities in the ED

- Configure flow of ED patients, staff, and materiel to minimize cross contamination.
 - Match ED triage and treatment protocols to local medical resource availability and prevailing “prevailing scarce resource allocation plans” <http://www.remm.nlm.gov/stdsofcare.htm>.
 - Consult senior medical and administrative staff regarding crisis care implementation.
 - Consider “Nuclear Detonation Scarce Resources Triage Tool” if resource availability is severely compromised. http://www.remm.nlm.gov/triagetool_intro.htm

Perform life-saving care before managing radiation issues.

Manage Patients with Radiation Contamination

- Coordinate radiation surveys of patients and decontamination procedures with facility radiation response personnel, (if available). <http://www.remm.nlm.gov/howtosurvey.htm>
- Remove patient’s clothing to eliminate a significant proportion of external contamination.
 - Rinsing skin with soap and water may also help, but avoid heavy brushing, scraping/abrading skin. Control contaminated run-off when possible. Critical patient care interventions *precede* formal decontamination efforts (unlike chemical contamination).
 - Radiation decontamination guidance: http://www.remm.nlm.gov/ext_contamination.htm
- Bag, label (date, time, name), remove contaminated clothing/personal effects of victims from the area.
- Consult radiation experts if internal contamination is suspected because the radiation survey remains significantly positive after external decontamination is completed.

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<http://disaster.nlm.nih.gov/dimrc/disasterapps.html>

Manage Patients with Radiation Exposure

- Look for early clinical signs and symptoms of **Acute Radiation Syndrome**: e.g., vomiting, diarrhea. More details: <http://www.remm.nlm.gov/physicalexam.htm>
- Use **Radiation Biodosimetry Tools** to estimate whole body radiation dose.
 - Obtain CBC with differential and platelet count.
 - Input **absolute lymphocyte count(s) value(s)** into **Interactive Calculator** to estimate whole body radiation dose http://www.remm.nlm.gov/ars_wbd.htm
 - Repeat CBC every 24 hours, if possible, to increase accuracy of dose estimate and management. If this is not possible values from a single or two CBCs can still be very valuable. In the absence of lab capacity, symptoms can provide a rough guide to exposure and prognosis.
 - Consider myeloid cytokines and antibiotics if whole body dose estimate ≥ 2 Gray and/or neutrophil count at or expected to reach $\leq 0.500 \times 10^9$ cells/liter
 - See prototype admission orders: <http://www.remm.nlm.gov/adultorderform.htm>
- Consider BOTH patient signs/symptoms AND radiation dose estimate when making clinical decisions about triage/treatment/transfer.
 - Re-assess each patient at regular intervals, as the clinical status may change over time. <http://www.remm.nlm.gov/nato-doserate.htm>
 - Consider that radiation exposure PLUS trauma or burn worsens a patient's prognosis. This may alter triage decisions. - <http://www.remm.nlm.gov/TriageToolscombined.pdf>
 - Assess carefully those at higher risk of morbidity from radiation exposure:
 - Young children, older adults, patients with immunosuppression and/or severe chronic illnesses
 - Consult algorithm for "**Hospital Approach to Patients Presenting After a Nuclear Detonation**". This algorithm assumes hospital resources are "inadequate for demand but not overwhelmed". http://www.remm.nlm.gov/hospitalapproach_algo.htm

Plan for Follow-up

- Ensure all patients and staff are registered in an incident database.
- Determine resources for follow-up for all ambulatory patients with suspected or proven radiation exposure and/or contamination who are not admitted. <http://www.remm.nlm.gov/followup.htm>
- Contact the **Radiation Injury Treatment Network (RITN)** for assistance with specialized radiation care: <http://www.ritn.net/> - E-mail: ritn@nmdp.org

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