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” [https://remm.hhs.gov/stdsofcare.htm](http://remm.hhs.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. [https://remm.hhs.gov/triagetool_intro.htm](http://remm.hhs.gov/triagetool_intro.htm)

**Manage Patients with Radiation Contamination**

- Coordinate radiation surveys of patients and decontamination procedures with facility radiation response personnel, (if available). [https://remm.hhs.gov/howtosurvey.htm](http://remm.hhs.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/abrating skin. Control contaminated run-off when possible. Critical patient care interventions precede formal decontamination efforts (unlike chemical contamination).
  - Radiation decontamination guidance: [https://remm.hhs.gov/ext_contamination.htm](http://remm.hhs.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.

_Please note: Perform life-saving care before managing radiation issues._
Manage Patients with Radiation Exposure

- Look for early clinical signs and symptoms of Acute Radiation Syndrome: e.g., vomiting, diarrhea. More details: https://remm.hhs.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 https://remm.hhs.gov/ars_wbd.htm

- Use Radiation Biodosimetry Tools to estimate whole body radiation dose. 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 \( \geq 2 \) Gray and/or neutrophil count at or expected to reach \( \leq 0.500 \times 10^9 \) cells/liter

- See prototype admission orders: https://remm.hhs.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. https://remm.hhs.gov/nato-doserate.htm

- Consider that radiation exposure PLUS trauma or burn worsens a patient’s prognosis. This may alter triage decisions. - https://remm.hhs.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”. https://remm.hhs.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. https://remm.hhs.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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