Managing Patients After a Nuclear Detonation

First Responders — 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 12-24 hours if possibly in the fallout area until movement is safer.
- **Stay tuned:** Emergency Alert System/Response Managers will update instructions.

What First Responders Should Wear: PPE

- PPE **can** protect against external contamination, internal contamination (via inhalation, ingestion, absorption through open wounds), and other physical hazards such as debris, fire/heat, or chemicals.
- PPE **cannot** protect against exposure from high energy, highly penetrating forms of ionizing radiation.
- Wear "PPE ensemble" suitable for the "level of dermal and respiratory protection" appropriate for your response role and risk of contamination. https://remm.hhs.gov/radiation_ppe.htm
- Personal dosimeters should be used by each responder or team to monitor exposure.
  - Wear it in proper location on your PPE.
  - Dosimeter should have features (e.g., alarm, real time read out) appropriate to your task, work location, and risk of exposure.
  - **Know your dose limit and turn back time.** (See exposure dose limits on back)
  - Return dosimeter to radiation safety team to record dose. Report dose if you will be using the same dosimeter on another activity.

Key Radiation Safety Concepts

- Limit your exposure to "as low as reasonable achievable": minimize exposure **time** and maximize **distance** and **shielding** from radiation sources. Remember that radiation levels from fallout decline rapidly as you move farther from the source and also decay over time to reduce the exposure in a specific area.
- Use standard procedures and best practices for donning and doffing PPE and personal decontamination. https://remm.hhs.gov/radiation_ppe.htm
- If no PPE used during work activity: remove all clothing when shift over; shower gently/wash hair; brush dust off your skin/hair/external clothes if changing and showering is not available.
- Avoid eating/drinking or smoking anything until you have been thoroughly decontaminated.
- Bag and dispose of contaminated clothes/gear safely.

Download Mobile REMM

https://remm.hhs.gov/downloadmremm.htm

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Key Concepts for Managing Patients in the Field

- Radiation injury evolves over time and can wait until patient is stabilized. Trauma care comes first!
- Know the triage system used in your area and any protocols for "scarce resources" situations.
- Determine appropriate patient destination depending on service policy, access, facility damage, injuries, and capacity. Non-hospital destinations may be utilized.
- Assist in patient collection centers/ambulatory care facilities, as assigned.

Focus on life threatening trauma/medical illness before managing radiation issues.

Minimize patient's external contamination

- **Ambulatory patients:** Perform self-decontamination with clothing change and showering with soap and water if possible, but avoid heavy brushing, scraping, or abrading skin. If standard decon is not available, brush any particle off clothes and exposed skin/hair to remove a major portion of external contamination.
- **Non-ambulatory patients:** Removal of clothing can remove a significant proportion of external contamination. Decontamination may be available in a very limited number of specialized decon tents with showers and roller lanes for litters. Control contaminated water runoff, if possible. Patient care is the priority rather than decontamination. Decon is a secondary priority as it protects the ambulance and receiving facility more than the patient.

Begin assessment of patient's dose from radiation exposure

- Look for early clinical signs and symptoms of **Acute Radiation Syndrome**: e.g., vomiting, diarrhea. See more details: https://remm.hhs.gov/physicalexam.htm .
    - Record patient location of initial radiation exposure on triage tag or medical record, as well as any symptoms and the time of onset as this may help estimate dose. However, vomiting is not specific and can be caused by other things – do not perform field triage for radiation illness unless specifically given policies.
- Re-assess each patient periodically as radiation or traumatic injuries can progress.

EPA Response Worker Guidelines - Early Response and Turn Back

- **5 Rem: annual** – occupational exposure limit
- **10 rem: acute dose** – protecting valuable property necessary for public welfare (e.g., a power plant)
- **25 rem: acute dose** – lifesaving or protection of large populations
- **Know that dose limits may vary by task, venue, professional capacity, incident type, and prior worker informed consent** https://remm.hhs.gov/pag.htm

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