

Radiation Exposure + Contamination: Diagnose and Manage

ASSESS EXTERNAL CONTAMINATION

- Contact radiation safety officer
- Put on Personal Protective Equipment
- Assess contamination pattern with radiation survey meter
- Evaluate for radioactive shrapnel
- Document contamination pattern on a body diagram
- Swab each nostril separately to help estimate level of internal (lung) contamination

CAUTION: MANAGEMENT MODIFIERS

- Burns
- Trauma
- Mass casualty
- Timing of surgery
- Blood products use
- At-risk/special needs populations

DECONTAMINATE WHOLE BODY

- Decontaminate either on-site or at other designated areas
- Follow decontamination procedures
- Re-scan patient with radiation survey meter
- Repeat decontamination until successful (Understand target levels for decon)
- Do not exceed 3 attempts (decon cycles)
- Special issues for infants and children

EVALUATE IF ALL ARE TRUE:

- Decontamination successful (Understand target levels for decon)
- Absent or minimal physical injury
- Whole/partial body dose from exposure likely to be < 2 Gy

YES

- Send home with follow-up instructions
- Register in incident database

On-site / Prehospital
Medical Facility / Hospital

NO

- Evaluate at medical facility

EVALUATE AT MEDICAL FACILITY

- Treat life- or limb-threatening injuries first
- Obtain serial CBCs with differential to evaluate possibility of exposure and ARS
- Remove any remaining radioactive shrapnel and shield it safely
- Surgical window of about 36-48 hours, depends on rate of dropping blood counts
- Treat non-life-threatening problems

ASSESS INTERNAL CONTAMINATION

- Scan patient with radiation survey meter (caveat)
- Incident responders or radiation safety officer will identify the isotope(s)
- Swab each nostril separately to help estimate level of internal (lung) contamination
- Collect ≥ 70 mL spot urine sample for isotope measurement
 - Instructions for sample collection, labeling, packaging and shipping
- Consider total body radiation survey with modified hospital nuclear medicine equipment

TREAT INTERNAL CONTAMINATION OF SPECIFIC ISOTOPE

- Isotopes of Interest Table
- Countermeasures Table
- Decision to treat will depend on
 - Level of internal contamination
 - Size of radiation incident
 - Availability of resources/personnel
 - Likelihood that patient will survive

DIAGNOSE/MANAGE EXPOSURE - ACUTE RADIATION SYNDROME

DECEASED

- Management of decedents with contamination
- Register decedent in incident database

SURVIVORS

- Discharge with appropriate follow-up instructions
- Register patient in incident database
- Radiation follow-up considerations
 - Whole body dose
 - Immune status
 - Risk of cancer
 - Risk of specific organ dysfunction

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