Radiation 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

DECONTAMINATE WHOLE BODY
- Decontaminate 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

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

NO
- Evaluate at medical facility

On-site / Prehospital
Medical Facility / Hospital

EVALUATE AT MEDICAL FACILITY
- Treat life- or limb-threatening injuries first
- Obtain sequential CBCs with differential to rule out whole body exposure and ARS
- Remove any remaining radioactive shrapnel and shield it safely

CAUTION: MANAGEMENT MODIFIERS
- Burns
- Trauma
- Mass casualty
- Timing of surgery
- Blood products use
- At-risk/special needs populations
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 event
  - Availability of resources/personnel
  - Likelihood that patient will survive

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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