

**REGION I EMERGENCY MEDICAL SERVICES  
STANDING MEDICAL ORDERS  
BLS**

**SMO: Acute Radiation Exposure**

**Revised Date:**

**Overview: Radiation injury can be divided into local radiation injury (LRI) and acute radiation syndrome (ARS) from high-dose whole body exposures. ARS is caused by irradiation of the entire body (or most of the body) by a high dose of penetrating radiation (gamma rays, certain x-rays and neutrons) in a very short period of time (usually a matter of minutes). The major cause of this syndrome is depletion of immature parenchymal stem cells in specific tissues. Examples of persons who suffered from ARS are the survivors of the Hiroshima and Nagasaki atomic bombs and the first-response firefighters to the 1986 Chernobyl Nuclear Power Plant event. All suspected or confirmed cases of acute radiation exposure must be report to the local department of public health and the Illinois Department of Public Health.**

**INFORMATION NEEDED**

- Is the scene safe for patient care providers
- Length of time of exposure
- Type of radiation
- Initial distance of the patient from the irradiation source
- How many possible patients are there

**OBJECTIVE FINDINGS**

- LRI can cause loss of body hair on exposed parts, redness or inflammation of the skin, layers of the skin are sloughed off in fine scales, , blisters and local tissue death.
- ARS: there are four distinct stages. There are also three classic ARS syndromes described.
  - Prodomal stage (N-V-D stage): The classic symptoms for this stage are nausea, vomiting and possibly diarrhea, depending on dose, that occur from minutes to days following exposure. The symptoms may last (episodically) for minutes up to several days. Symptoms which begin soon after exposure indicate a higher exposure and a poor prognosis for the patient.
  - Latent stage: In this stage the patient generally looks and feels healthy for a few hours or even up to a few weeks.
  - Manifest illness stage: In this stage, the symptoms depend on the specific syndrome and last from hours up to several months.
  - Recovery or death: Most patients who do not recover will die within days to several months after exposure. The recovery process may last from several weeks up to two years.
- ARS Syndromes
  - Bone Marrow Syndrome: The full syndrome usually will occur with a dose between 70 – 1000 rads though mild symptoms may occur as low as 30 – 3000 rads. The survival rate of patients with this syndrome decreases with increasing dose. The primary cause of death is the destruction of bone

**marrow, resulting in sepsis and hemorrhage.**

- **Gastrointestinal Syndrome: The full syndrome usually will occur with a dose of between 1000 – 10,000 rads though some symptoms may occur as low as 600 rads. Survival is extremely low with this syndrome. Destructive and irreparable changes in the gastrointestinal tract and bone marrow usually cause infection, dehydration and electrolyte imbalance. Death usually occurs within 2 weeks.**
- **Central Nervous System Syndrome: The full syndrome usually will occur with a dose greater than 5000 rads though some symptoms may occur as low as 2000 rads. Patients experience confusion, disorientation, seizures, cerebral edema and coma, Death occurs within 3 days.**

### **BLS**

- \_\_\_ Safety of the EMS personnel is primary
- \_\_\_ Assess the patient for trauma issues
- \_\_\_ Suction as needed
- \_\_\_ Measures to protect the patient's airway
- \_\_\_ Vital signs
- \_\_\_ Provide supplemental oxygenation as needed with a nasal cannula at 2-6 LPM or by non-rebreather mask at 10-15 LPM
- \_\_\_ Ionizing radiated patients usually do not need decontamination but those exposed to radioactive solids or liquids will need to have their clothes removed and irrigation of all skin with water.

Documentation of adherence to protocol:

- \_\_\_ Oxygen provided
- \_\_\_ Suctioning and airway measures provided

### **Medical Control Contact Criteria**

- \_\_\_ • In all probability it will be known that patients have been exposed to radiation. Contact Medical Control as soon as possible so that all receiving hospitals will be able to receive and handle this type of patient or patients.

### **PRECAUTIONS AND COMMENTS**

It is imperative that the EMS personnel are familiar with local, area and state guidelines for handling of a radiation accident. Protocols are established for safe handling of the scene, rescuers and the patient by these guidelines.

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- \_\_\_ IV of NS to combat dehydration

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