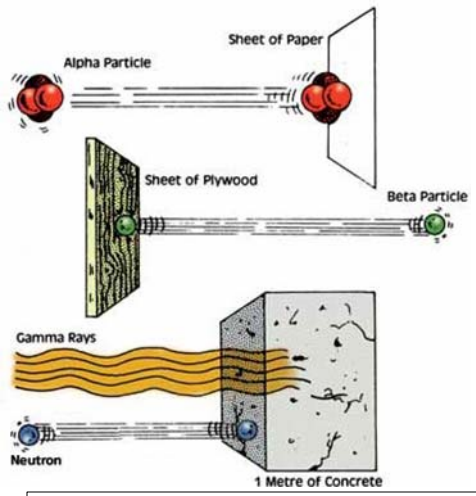
# Burns Resources and Considerations

## Radiation Considerations

**History:**
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

**Signs and Symptoms:**
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress
- singed facial or nasal hair
- Hoarseness / wheezing

**Differential:**
- **Superficial (1st Degree)** red and painful
- **Partial Thickness (2nd Degree)** blistering
- **Full Thickness (3rd Degree)** painless/charred or leathery skin
- **Thermal**
- **Chemical**
- **Electrical**
- **Radiation**




Universal Patient Care Protocol
*(Don PPE. Dealing with a patient with a radiation exposure can be a frightening experience. Do not ignore the ABC's, a dead but decontaminated patient is not a good outcome. Refer to the Decon guideline for more info.)*

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***Follow Burn Triage Guidelines and:***
Remove Rings, Bracelets, and other Constricting Items, Remove clothing or expose area

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***Collateral Injury:*** Most all injuries immediately seen will be a result of collateral injury, such as heat from the blast, trauma from concussion, treat collateral injury based on typical care for the type of injury displayed.

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***Qualify;*** Determine exposure type; external irradiation, external contamination with radioactive material, internal contamination with radioactive material.

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***Quantify:*** Determine exposure (generally measured in Grays/Gy). *Information may be available from those on site who have monitoring equipment, do not delay transport to acquire this information.*

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***Radiation Burn Patients Must be Triaged for transport destination using the Guidelines included in this work. Their care must conclude in the Thermal Burn Protocol, or, the appropriate Treatment Protocol for the Patient's collateral injury. If in doubt, contact Medical Control and transport.***

**Time Phases of Radiation Injury**
**(Exposure Dose vs Clinical Outcome)**

| Exposure Dose (Gy) | Prodrome Severity | Manifest Illness - Symptom Severity | | | Prognosis |
|---|---|---|---|---|---|
| | | Hematologic | Gastrointestinal | Neurologic | |
| 0.5 to 1.0 | + | + | 0 | 0 | Survival almost certain |
| 1.0 to 2.0 | +/++ | + | 0 | 0 | Survival >90 percent |
| 2.0 to 3.5 | ++ | ++ | 0 | 0 | Probable survival |
| 3.5 to 5.5 | +++ | +++ | + | 0 | Death in 50% at 3.5 to 6 wks |
| 5.5 to 7.5 | +++ | +++ | ++ | 0 | Death probable in 2-3 wks |
| 7.5 to 10 | +++ | +++ | +++ | 0* | Death probable in 1-2.5 wks |
| 10 to 20 | +++ | +++ | +++ | +++ | Death certain in 5-12 days |
| > 20 | +++ | +++ | +++ | +++** | Death certain in 2-5 days |

**Abbreviations:** Gy: dose in Grey;
0: no effects; +: mild; ++: moderate; +++: severe or marked

* Hypotension
** Also cardiovascular collapse, fever, shock

Modified from : Waselenko, JK, MacVittie, TJ, Blakely, WF, et al. Medical management of the acute radiation syndrome: Recommendations of the strategic national stockpile radiation working group. Ann Int Med 2004; 140:1039.

**Pearls: Radiation**
- There are three methods of exposure; external irradiation, external contamination and internal contamination.
- There are two classes of radiation; ionizing (greater energy) and non-ionizing (lower energy). Ionizing radiation is the most dangerous and is generally in one of three states: Alpha Particles, Beta Particles and Gamma Rays. Non-ionizing examples include microwaves, radios, lasers and visible light.
- Radiation burns with early presentation are unlikely, it is more likely this is a combination event with either thermal or chemical burn being presented as well as a radiation exposure. Where the burn is from a radiation source, it indicates the patient has been exposed to a significant source, (> 250 rem).
- Patients experiencing Radiation poisoning are not contagious. Cross contamination is only a threat with external and internal contamination.
- Typical ionizing radiation sources in the civilian setting include soil density probes used with roadway builders and medical uses such as x-ray sources as well as radiation therapy. Sources used in the production of nuclear energy and spent fuel are rarely exposure threats as is military sources used in weaponry. Nevertheless, these sources are generally highly radioactive and in the unlikely event they are the source, consequences could be significant and the patient's outcome could be grave.
- The three primary methods of protection from radiation sources include limiting time of exposure, distance from, and shielding from the source.
- Dirty bombs generally include the use of previously used radioactive material and combined with a conventional explosive device to spread and distribute the contaminated material.
- Refer to Decontamination Standard Procedure (Skill) WMD Page for dirty contamination events.
- If there is a time lag between the time of exposure and the encounter with EMS, key clinical symptom evaluation includes: Nausea/Vomiting, hypothermia/hyperthermia, diarrhea, neurological/cognitive deficits, headache and hypotension.