



**RADIATION FROM PLUTONIUM (Pu)
(*Treatment also applies to yttrium, americium, curium, and
californium)**

Agent Information:	Plutonium radioisotopes are a class of highly toxic and unstable chemicals whose radioactivity is measured by the number of atoms disintegrating per unit time. Plutonium radioisotopes emit radiation as high-energy alpha particles, medium-energy gamma rays, x-rays, and beta particles. This ionizing radiation disrupts molecules in cells and deposits energy in tissues, causing damage. Plutonium is used to produce nuclear weapons and is also used as a heat source in nuclear batteries to produce electricity in devices.
Route of Exposure:	Inhalation and ingestion are the most likely routes for internal contamination from plutonium radioisotopes. Internal exposure continues until the radioactive material is flushed from the body by natural processes, or decays. Inhaled or ingested radionuclides are distributed to different organs and remain there for days, months, or years until they decay or are excreted. Once internalized, plutonium radioisotopes can most significantly affect lungs, bone, and liver as target organs.
Signs and Symptoms:	Exposure to ionizing radiation from Plutonium causes immediate or delayed health effects. Observable effects occurring soon after receiving very large doses include hair loss, skin burns, nausea, gastrointestinal distress, or death (Acute Radiation Syndrome). Long-term risks, including increased cancer risk, are a function of the specific radioisotopes involved; and depend on the route, magnitude and duration of exposure.
Protective Measures:	Emergency medical care to save lives is the first priority. Effective patient decontamination is important to limit the spread of radioactive materials in the hospital, and to prevent exposure to other patients and staff. Achieve dose reduction by limiting the time people are exposed, avoiding direct contact, maintaining distance from the source, and using shielding or respiratory protection to prevent ingesting or inhaling contamination. Since deceased victims from a radiological event involving release of airborne Plutonium radioisotopes could be contaminated both internally and externally, they should be handled using reverse isolation.

24/7 Emergency Contact Number: 1-888-295-5156

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- Lab Samples Requested for Evaluation:** CBC with absolute lymphocyte count. Repeat measurements for at least 48 hours.
- Prophylaxis:** Appropriate PPE to avoid secondary contamination.
- Treatment:** Supportive care and decontamination are indicated. Treatment to reduce internal dose is indicated for known uptake of Plutonium, Yttrium, and other transuranic radioisotopes such as americium, californium, and curium. Treatment is to administer Zinc-DTPA or Calcium-DTPA (diethylenetriaminepentaacetate) to induce chelation, increase elimination, and reduce radioisotope body burden. Expert guidance on medical treatment is available from REAC/TS at: 1-865-576-1005 (24/7 coverage).
- Reporting:** Immediately report suspect cases to the Division of Public Health, 1-888-295-5156 (24/7 coverage).
- For Additional Information:** Visit the CDC website: <https://emergency.cdc.gov/>.