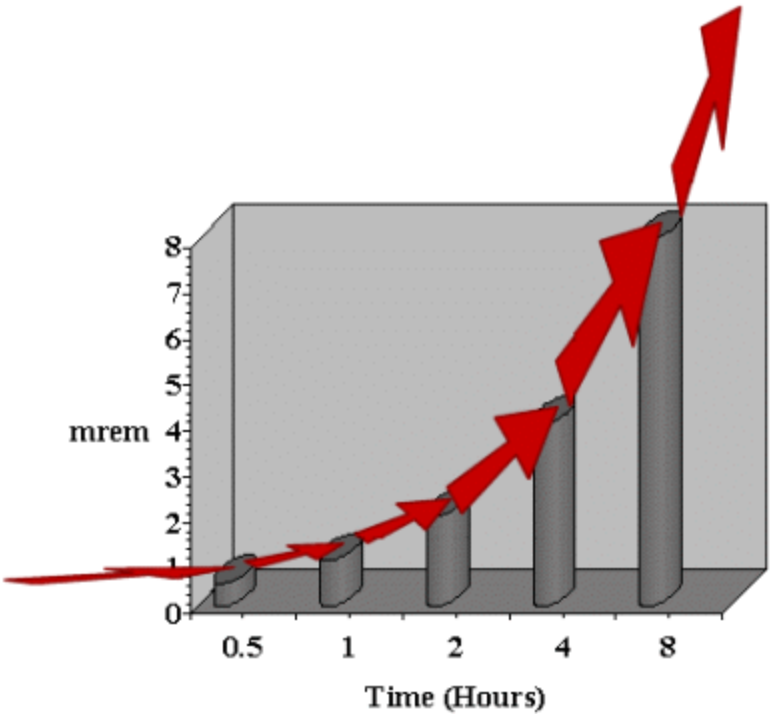
HARVARD
Campus Services
ENVIRONMENTAL HEALTH & SAFETY

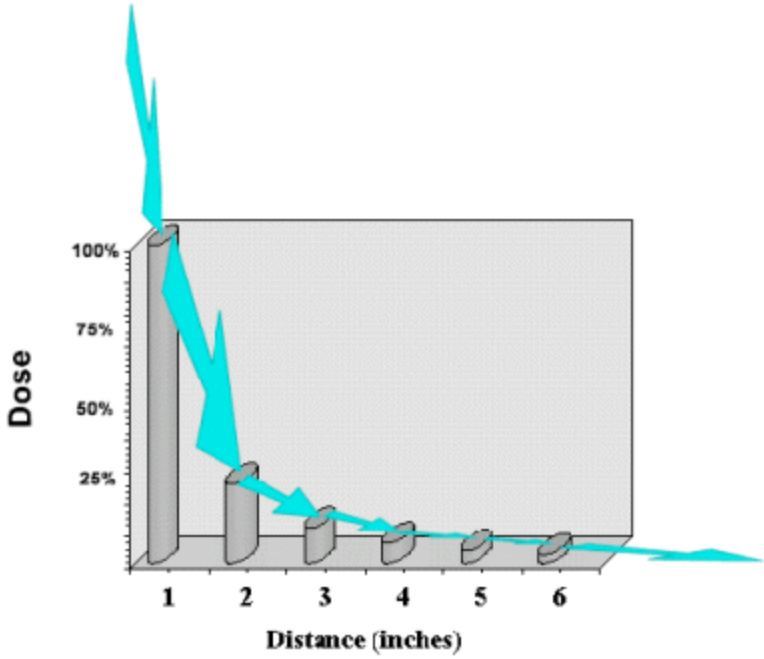
## Radiation External Dose Minimization Principles

Carefully plan your activities to minimize your exposure to radiation.

### Time

Plan to minimize the time handling or being near radiation sources. The relationship of exposure to time is shown below for exposure to a 1 mrem/hr source:



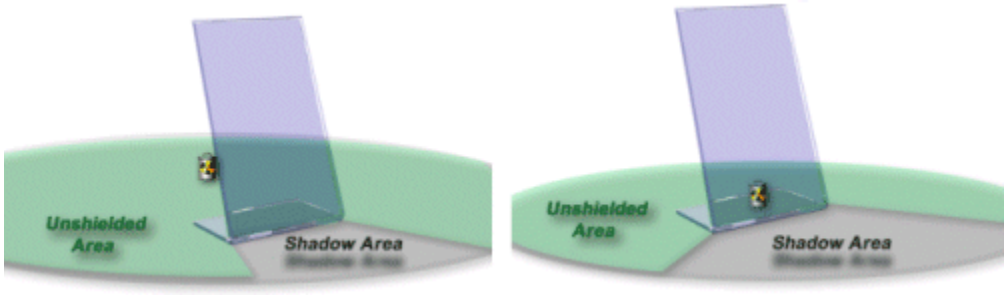




### Distance

Increase the distance from a radiation source by the using remote handling like tongs or by sample holders. For example, doubling your distance from a source will cut down your exposure to 25% of the original amount.

## Shielding

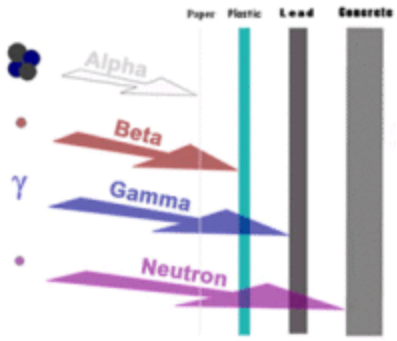
• Use shielding appropriate for the radionuclide that you are using. An effective shield should provide protection in all directions. Place the radioactive material close to the shield to maximize the "shadow area" (area where radiation is blocked out by the shield) cast by the shield are protected.

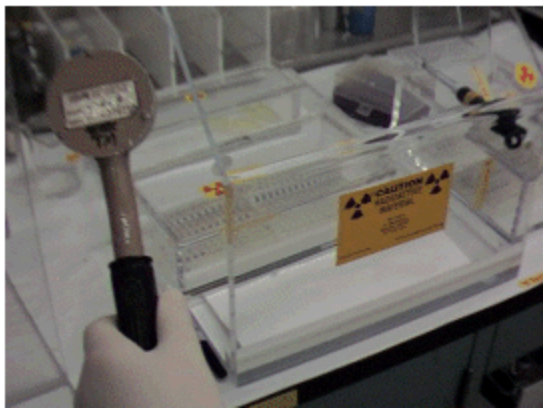



• Do not use lead with high energy beta radiation (e.g. $^{32}P$) because it will cause secondary radiation that a more penetrating x-ray type radiation.

• For beta radiations, use low Z materials such a plastics, Lucite, Plexiglas, and glass. For gammas, use lead foil (roof flashing) or thin lead sheets (for $^{125}I$ ).

• Survey shielding to ensure proper placement.



Email **radiation_protection@harvard.edu** to send comments and suggestions to the Radiation Protection Office