

# How to Reduce Exposure to Radiation Time, Distance and Shielding

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Division of Environmental Health  
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Because exposure to ionizing radiation carries a risk, should we avoid it entirely? Even if we wanted to, this would be impossible. Radiation has always been present in the environment and in our bodies. We can however avoid undue exposure and minimize the exposures from radiations we cannot altogether avoid.

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### ALARA

The guiding principle behind radiation protection is that radiation exposures should be kept "As Low As Reasonably Achievable (ALARA)," economic and social factors being taken into account. This common-sense approach means that radiation doses for both workers and the public are typically kept lower than their regulatory limits.

### Time, Distance, and Shielding

How do you protect yourself? There are three concepts in basic radiation protection. They are:



## Time

If you decrease the amount of time you spend near the source of radiation, you will decrease the amount of radiation exposure you receive. To imagine this, think of a trip to the beach as a comparison. For instance, if you spend a lot of time on the beach, you will be exposed to the sun, and, ultimately, get a sunburn. If you spend less time in the sun and more time in the shade, your sunburn will be much less severe. This is similar to the way radiation exposure works.

## Distance

The farther away you are from a radiation source, the less exposure you will receive. Compare this to an outdoor concert. You can sit directly in front of a speaker, 50 yards from the stage, or on the grass in the park across the street. If you sit in front of the speaker, you will probably suffer some damage to your hearing. If you sit 50 yards from the stage, you will be exposed to an average amount of music. If you sit in the park across the street, the noise is even further reduced and you might not even hear the concert, or even know what song they are playing.

Radiation exposure is similar. The closer you are to the source, the greater your chances for developing some damage to your body. If you are far from the source, your exposure would be much lower since the intensity of radiation decreases the further you are from the source of the radiation.

## Shielding

If you increase the shielding around a radiation source, it will decrease your exposure. For example, if you stand out in the rain *without* an umbrella, you will get wet. But, if you use an umbrella to shield you from the rain, you will remain dry and protected. This is similar to the idea of shielding in radiation protection.

Barriers of lead, concrete or water give good protection from penetrating radiation such as gamma rays. Radioactive materials are therefore often stored in lead or water containers, handled under water, or handled by remote control in rooms constructed of thick concrete or lined with lead.

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## Sources

Health Physics Society, <http://www.hps.org/publicinformation/radterms>

Environmental Protection Agency, <http://www.epa.gov/radiation/understand/protection.basics.html>

Links to external resources are provided as a public service and do not imply endorsement by the Washington State Department of Health.