Plutonium

WHAT IS PLUTONIUM?

Plutonium is a heavy metal, like lead or uranium. Most of the plutonium used in weapons is Pu-239 that has a radioactive half-life of about 24,000 years. Plutonium released in a weapons accident is in the chemical form of plutonium oxide.

EXPOSURE TO PLUTONIUM

Exposure to plutonium could result from a person inhaling or ingesting some of the plutonium oxide released during a weapons accident. The plutonium oxide is carried in the smoke plume or cloud that results from the weapon explosion or from a fire after the explosion.

Once the plutonium particles from the plume have settled on the ground, they can get back up into the air or become "resuspended" by the wind, vehicles driving through the area or by people walking through the contaminated area. How much gets back into the air depends on how much is on the ground and the nature of the ground surface, (dry, wet, flat, rocky, grassy etc.) This can also lead to a person inhaling plutonium particles.

Another way people can get contaminated with plutonium is by eating crops that have become contaminated or by touching a contaminated area with their hands and then touching their nose or mouth. This type of exposure is expected to be less than inhalation.

WHY IS PLUTONIUM HAZARDOUS?

Plutonium is an internal body hazard. Even high levels of plutonium contamination on the ground will not produce any significant external radiation hazards. If the plutonium gets inside the body it can deposit alpha particles into living cells delivering a "dose" of radiation to the individual. The radiation can damage or kill the cells.

Radiation exposure from a weapons accident is unlikely to cause immediate ill health affects. The concern from such an exposure is that a person may inhale or ingest enough plutonium to increase their risk of getting cancer.

About 40% of the plutonium taken in with a breath of air is exhaled immediately. Within the first week, a large fraction of the plutonium that was inhaled will be cleared out of the lungs and removed from the body via the gastrointestinal tract. Over the next several months and years the remaining plutonium is either cleared from the lungs into the gastrointestinal tract and then eliminated or absorbed into the blood stream. Plutonium absorbed in to the bloodstream will be deposited primarily in the bones and liver where it remains for many years.

WHAT IF I AM EXPOSED TO PLUTONIUM?

You may have been exposed if you were 5-10 miles downwind of the accident site where the initial plume of smoke from the fire or explosion traveled. You may also be exposed if you traveled through areas where the contamination settled from the plume.

If you were in one of the areas described above you should contact the appropriated state or federal agency in the area and let them know. They will arrange for the appropriated test to be done to determine if you have been contaminated.

Testing will include getting samples of feces and/or urine. Analysis of stool samples provides the most accurate determination of how much plutonium was inhaled. This is because the lungs have a "self-cleaning" system that moves inhaled just up out of the lungs into the throat, where it is

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swallowed then eliminated through the gastrointestinal tract. Urine samples are less sensitive than stool samples but sometimes provide useful information.

Another detection method is called a "lung count." This is performed by placing a very sensitive radiation detector near a person's chest to "look" for low energy x rays emitted by the plutonium mixture. The lung count is different form an x-ray exam. It is a passive exam – the individual undergoing the exam receives no radiation dose. A quick screening exam may take 10- 15 minutes. A more sensitive exam performed at a special "whole body counting" facility typically takes about 45-50 minutes.

WHAT CAN DO IF I AM EXPOSED ?

As stated earlier the body will begin eliminating the plutonium through normal pathways for excreting wastes.

However, if a person has a seriously high intake of plutonium, doctors attending the patient may consider using a drug called "DTPA" which can speed up the elimination of the plutonium from the body. This is known as a chelating agent.

If your house was downwind of the smoke plume it is possible that it may be contaminated. If you believe your house has been contaminated contact the state or federal authorities. They will arrange for a team of survey experts to go to your home and check for possible contamination.

OTHER ARES THAT MAY BE EXPOSED

Water bodies in the area such as lakes and rivers may get plutonium in them from the smoke plumes. The plutonium will settle to the bottom and eventually be trapped in the sediment. Bottom feeding fish may ingest some of the contaminated sediment. Very little plutonium is absorbed into an animal's body through its gastrointestinal tracts. So very little plutonium would be in the meat of the fish that you might eat. But it is still a good idea to check with the appropriate state and federal experts regarding eating fish from waters that have been contaminated with plutonium.

Fruits and vegetables grown in the area of contamination may have plutonium on them from the smoke plume. Although most of this plutonium could be washed off easily it is better if you discard the contaminated fruity or vegetable that you know was exposed. Uptake to plants from the soil is generally very low so the levels of plutonium in produce grown after the initial plume passage will be insignificant.

It is unlikely that ground water would become contaminated. Plutonium does not migrate very well through soil. However groundwater in the area of contamination will be tested before approved for use.

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