WHO/RAD Information sheet
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Radiological Dispersion Device (Dirty Bomb)

Recent terrorist events have raised concern about the possibility of a terrorist attack involving radioactive materials, possibly through the use of a "dirty bomb". Information in this text should help people understand what a dirty bomb is, what they can do to minimize any consequences if they are near the site of such an explosion, and how it may affect their health.

What is a "dirty bomb"?

A dirty bomb, or radiological dispersion device, is a bomb that combines conventional explosives, such as dynamite, with radioactive materials in the form of powder or tiny pellets packed around the explosive material. The idea behind a dirty bomb is to spread radioactive material into some populated area. This could contaminate buildings and the local environment, and expose people to radiation emanating from the radioactive material. Persons could be externally (skin) contaminated or internally contaminated with radioactive materials through inhalation, ingestion, or through wounds.

The main purpose of a dirty bomb is to frighten people by contaminating their environment with radioactive materials and threatening large numbers of people with exposure. Such use of radiation is only hypothetical and has not been used by terrorists before, but the possibility exists. Dirty bombs are designed to spread fear and panic.

Dirty bomb versus atomic bombs in Hiroshima and Nagasaki

The atomic bomb explosions in Hiroshima and Nagasaki were nuclear weapons involving a fission reaction. Extreme heat, blast or pressure wave and ionizing radiation together can cause severe harm, death of hundreds of thousand of people within weeks and contamination of large areas. By contrast, a dirty bomb is not an atomic explosion, it can only spread radioactive material and contaminate a relatively small area. Dirty bombs are not weapons of mass destruction. Their effect is very much less than of a nuclear bomb.

Health effects of a dirty bomb

The primary danger from a dirty bomb would be the blast itself. It is difficult to assess how much of an effect on health might come from the radiation when the source type and activity are unknown. ***However, at the levels of most probable sources, not enough radiation would be present in a dirty bomb to cause significant illness***. Well trained experts (medical, health physics, and radiobiologists) will be able to assess risks after the exposure level has been determined. In any event, medical doctors will have to assess the health consequences for each individual exposed, after a careful physical examination of signs and symptoms observed. Cancer risk from a dirty bomb is estimated to be very low.

What people should do following an explosion

Radiation cannot be detected by our human senses. Therefore, if people are present at the site of an explosion, they will *not know* whether radioactive materials were used. If people are not injured by the initial blast, they should:

- Leave the immediate area on foot. Do not panic. Do not take public or private transportation such as buses or cars before they have been checked by competent authorities for contamination with radioactive materials.
- Go inside the nearest building. Staying inside will reduce people's exposure to any radioactive material that may be present as dust at the scene.
- Remove clothes as soon as possible, place them in a plastic bag, and seal it. Removing clothing will eliminate most of the external radiation exposure from any radioactive materials deposited on them. Saving the contaminated clothing would allow testing for exposure without invasive sampling.
- Take a shower or wash as best you can. Washing will reduce the amount of radioactive contamination on the body and effectively reduce total exposure.
- Be on the lookout for information about the blast. Once emergency personnel monitor the scene and assess the damage, they will be able to tell people whether radioactive materials were involved and if any radiation induced health effects may be expected.
- Seek medical advice if you were near (within a few hundred meters) from the blast.
- Do not take stable iodine (e.g. potassium iodide) tablets without being told by competent authorities. It is not relevant for protection against possible health effects of a dirty bomb. If you need iodine prophylaxis you will be advised by the relevant public health or state emergency authority. Do not self-medicate but follow the directions from these authorities.

*Even if people do not know whether radioactive materials were present, following the simple steps above can also help reduce any injury from **chemicals** present in the blast.*

If radioactive materials were involved

Keep your television or radio tuned to local news networks for information about the incident. If a radioactive material was released, people will be told by the competent authorities where to report for radiation monitoring and what steps to take to protect their health.

For more information about dirty bombs and response to them, see the following websites:

- World Health Organization:
  http://www.who.int/ionizing_radiation/en/

- International Atomic Energy Agency:
  http://www.iaea.org/worldatom/Press/Focus/RadSources/Radiolog_devices.html
- http://www.iaea.org/worldatom/Press/Focus/Nuclear_Terrorism/

- U.S. Nuclear Regulatory Commission:
  http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/dirty-bombs.html

- Centre for Disease Control and Prevention:
  http://www.bt.cdc.gov