



Just the Facts...

Depleted Uranium - Individual

DEPLETED URANIUM IS A DENSE, SLIGHTLY RADIOACTIVE HEAVY METAL USED IN AMMUNITION, ARMOR AND AIRCRAFT. IT HAS 40% LESS RADIOACTIVITY THAN NATURAL URANIUM.

GENERAL INFORMATION	<p>Uranium is an element found naturally in soil, water, and mineral deposits. It is a slightly radioactive substance composed of 3 naturally occurring isotopes (isotopes are atoms that differ only in their number of neutrons; they have similar physical properties), ²³⁸U, ²³⁵U, and ²³⁴U. All three isotopes are found together in Uranium ore. Depleted uranium is what remains after the more radioactive isotopes, ²³⁴U and ²³⁵U, are removed from uranium ore in order to make enriched uranium. Enriched uranium, which contains the more radioactive isotopes, is primarily used as fuel in nuclear reactors. All uranium, not just DU, is made up of almost all ²³⁸U. Natural and depleted uranium differ only in their radioactivity. Depleted uranium is roughly half (60%) as radioactive as natural uranium because there are less of the more radioactive isotopes (²³⁴U and ²³⁵U). The chemical properties of the isotopes are the same. It is the chemical properties that are responsible for many of the health effects of concern, such as possible kidney effects. Depleted uranium also contains trace amounts of ²³⁶U and other trace substances such as plutonium, americium and technetium. These amounts are so small that they are very difficult to measure and have no affect on health or the environment. Everyone has some natural exposure to uranium, and it can be measured in the urine.</p>
ROUTINE USES IN THE DEPLOYED SETTING	<p>The United States Armed Forces have used DU in the manufacture of munitions, armor and armor-piercing projectiles. DU's high density, self-sharpening qualities, and the fact that it is easily combustible make its projectiles capable of readily penetrating armor made with less dense metals. Due to its density, armor constructed with DU provides a high degree of shielding and resistance to penetration. During the 1991 Gulf War (GW), depleted uranium containing munitions were used on a large scale for the first time. In the manufacture of projectiles and armor, depleted uranium is alloyed with small amounts of other metals.</p>
EXPOSURE LEVELS HISTORICALLY ENCOUNTERED	<p>When a vehicle is impacted and perforated by a DU projectile, the projectile splits into small shards, many of the small shards burst into flames, and fill the insides of the vehicle with flying metal, fumes, and particulates. The bulk of a DU projectile may pass directly through the vehicle. The inside of the damaged vehicle remains contaminated with particles of DU and its oxides after the impact. In the event of a vehicular fire, the heat of the fire can cause any onboard DU ammunition to oxidize. Personnel in, on, or near (less than 50 meters) an armored vehicle when the vehicle is being penetrated by a depleted uranium munition may have exposures to DU that are greater than the general populations natural exposure by breathing it in, getting dust in their mouth, or in a wound if hit by high velocity depleted uranium shards. Some crew members may be left with multiple tiny fragments of uranium scattered through their muscle and soft tissue. Other soldiers may be exposed to DU during operations to salvage combat vehicles that have been disabled by DU rounds and may resuspend DU dust from the vehicles surfaces, Those who routinely enter damaged vehicles in recovery operations or fight fires involving DU are expected to have less of an exposure to DU, but still more than the general population. While soldiers followed from the first Gulf War with retained DU fragments have not shown ill health effects, we are recommending that any soldier in either of these categories have a urine specimen so that the dose of DU can be measured. Depending on the amount measured, these soldiers may be followed over time. Simply riding in a vehicle with intact DU munitions or DU shielding will not result in significant intakes of DU. Exposure by breathing fumes of burning DU metal only occurs if the vehicle is hit or if the soldier is near a target hit by DU munitions. DU Awareness Training explains how to avoid unnecessary exposure to DU in damaged vehicles.</p>

<p>SIGNS AND SYMPTOMS OF ACUTE AND CHRONIC EXPOSURE</p>	<p>DU is a metal, like lead and others, and when there are large amounts in the body, they can damage the kidneys when the kidneys filter the metal into the urine. By measuring how much DU goes into the urine, we can determine whether or not a person is spilling more DU into the urine than normal. If they are, this is a signal that they have been exposed more than a regular person. While there are no noticeable effects that a person would notice, over time, filtering the extra DU could damage the kidneys. For this reason, if it is suspected that a soldier had a higher than normal exposure, we measure the amount in the urine, and then decide whether we need to follow the soldier to check their kidneys from time to time. You don't need to get any special treatment. Soldiers who have DU shrapnel that is not removed are followed because the DU comes out into the urine a little at a time. The shrapnel usually doesn't cause any health concern just because it is DU instead of another metal, but since the DU will come out and leave the body overtime, these soldiers are followed. If you breathe or get DU dust in your mouth, you should not have any immediate health effect, but we will also look at how much DU is in your body. Since the amount of radioactivity in DU is not much, it is not thought that there is any concern for cancer from radiation. All people have some exposure to uranium and radioactive materials naturally.</p>
<p>MEDICAL TREATMENT</p>	<p>If you are wounded with a DU fragment or piece of shrapnel, the treatment will be based on removal of the fragment, just as a bullet is removed. Some bullets are stuck in places that make it hard to remove and the surgeons decide to leave them in place rather than damage tissue trying to dig them out. If that happens, we do look at how much DU is leaving the body to decide if the kidneys should be watched closely. DU fragments will show up on X-rays just like bullets. Someone with a retained fragment of DU is not "radioactive" and does not pose a risk to others. Individuals who have breathed in DU should not have any acute symptoms and should be treated only if injured.</p>
<p>LONG TERM MEDICAL SURVEILLANCE REQUIREMENTS OF HEALTH EFFECTS MONITORING</p>	<p>Since 1993, the Department of Veterans Affairs has been following 35 Gulf War veterans who were seriously injured in friendly fire incidents involving depleted uranium. These veterans are being monitored at the Baltimore VA Medical Center. About half of this group still has depleted uranium metal fragments in their bodies. Those veterans with retained depleted uranium fragments have shown higher than normal levels of uranium in their urine since monitoring began in 1993. These veterans are being followed very carefully and numerous medical tests are being done to determine if the depleted uranium fragments are causing any health problems. For all 35 veterans in the program (including those with retained depleted uranium fragments), all tests for kidney function have been normal. In addition, the reproductive health of this group appears to be normal in that all babies fathered by these veterans between 1991 and 1997 had no birth defects.</p> <p>Any individuals who may have been exposed to DU as described above will be followed to see if they have higher than normal amounts of DU in their urine. If they do, they will be checked periodically for health problems, although none are expected based on the previously followed veterans.</p>
<p>SPECIAL RISK COMMUNICATION INFORMATION</p>	<p>Depleted uranium is only one of many potentially hazardous substances that soldiers may be exposed to during deployment and combat operations. There are two potential hazards associated with exposure to large amounts of DU aerosols. The primary concern is the effects on the kidneys of high doses. The second area of concern is with DU's low-level radioactivity. Follow-up of individuals with retained DU fragments have not shown health effects of concern related to internalized DU. Those individuals who show elevated DU in the screening urine bioassay as compared with natural background levels will be followed as a precaution.</p>