



Just the Facts...

Depleted Uranium

General Information	<ul style="list-style-type: none">➤ Uranium is an element found naturally in soil, water and mineral deposits. Individuals may be exposed to naturally occurring uranium through ingestion, inhalation and skin contact.➤ Depleted uranium (DU) is the by-product of converting uranium ore into enriched uranium for nuclear fuel. DU is approximately 40% less radioactive than natural uranium.➤ DU is used in civilian applications requiring high density materials, such as aviation (as counterweights), satellite ballast, and petroleum exploration (drilling equipment). DU is useful for radiation shielding in equipment used for radiation therapy and containers for radioisotopes.➤ While the ADF does not use DU munitions, the U.S. Armed Forces use DU in the manufacture of munitions, armour and armour-piercing projectiles. DU's high density, self-sharpening qualities and easy combustibility make DU projectiles capable of readily penetrating armour made of less dense metals. DU armour provides a high degree of shielding and resistance to penetration.➤ The principal radiation emitted by uranium is alpha particles. These particles have an extremely short range in air and are unable to penetrate a sheet of paper or human skin. However, inhalation and retention of uranium particles may expose immediately adjacent internal tissues to ionising radiation from alpha particles.➤ DU emits very small amounts of the more penetrating beta and gamma rays.
Health Hazard	<ul style="list-style-type: none">➤ The chemical toxicities of natural uranium and DU are identical. The potential health effects of DU depend on the type of exposure (internal or external), route of exposure (inhalation, ingestion or wound contamination), solubility of the DU and magnitude of exposure.➤ Effects due to external exposure to DU relate only to its radioactivity and are extremely small because DU is primarily a low-energy alpha particle emitter. However, when DU gains access to the body adverse health effects may arise from both chemical and radiological toxicity.➤ Close proximity to DU metal, as may occur in storage facilities, in carrying shells or during carriage in armoured vehicles, even when prolonged, produces negligible internal radiation exposure and levels of external radiation exposure well below those recommended for occupational safety.➤ Machining or drilling the DU ballast in ADF aircraft such as the F111 may create a health hazard. Do not drill or machine DU ballast or other DU-containing parts.

Note: The sponsor for this Fact Sheet is the Directorate of Preventive Health within DHSB. All comments and questions should be forward to DHSB, DPH, Campbell Park Offices (CP 2-7-154), Canberra ACT 2600 or email DPH.DHS@defence.gov.au

<p>Routes of Exposure</p>	<ul style="list-style-type: none"> ➤ When a vehicle is struck and perforated by a DU projectile, the projectile splits into small shards, many of which ignite and fill the inside of the vehicle with flying metal, fumes and particulates. The bulk of a DU projectile may pass completely through the vehicle. ➤ The inside of the damaged vehicle will contain DU particles. ➤ In the event of a vehicular fire, the heat of the fire can cause any on-board DU ammunition to oxidise. However, the explosion risk is far greater than that from radiation ➤ Personnel in, on, or within 50 metres of a vehicle when the vehicle is hit by a depleted uranium munition may be exposed to DU by inhalation, getting dust in the mouth, or in a wound caused by high velocity depleted uranium shards. ➤ Other personnel 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 will be exposed to low levels of DU, but at a level above that experienced by the general population.
<p>Health Screening</p>	<ul style="list-style-type: none"> ➤ All individuals excrete uranium in their urine resulting from exposure to naturally occurring uranium in the environment. The level of excretion varies with geographic location and with natural levels of uranium in air, food, water and soil. ➤ Once absorbed, approximately 90% of the uranium is excreted through the kidneys within a few days, via urine. The remaining 10% is deposited into organs and tissues in particular kidney and bones (but also lungs, liver, lymph glands and other organs) and is then slowly excreted in urine over a period of years. ➤ Urinary uranium screening may be used to determine whether an individual has been exposed to uranium above the background level, the source of such uranium exposure, and how long ago such exposure occurred. The relationship between levels of uranium in urine and possible health effects is unclear. ADF members returning elevated results require further investigation and/or monitoring. ➤ Where urinary uranium screening is offered or requested, appropriate counselling must be undertaken both before and after screening. Such counselling involves checking the self-reported risk level of the individual and highlighting to the examinee the difficulties of accurate risk assessment based on exposure history alone. Examinees should be advised that there is no evidence suggesting any adverse effect on the ability to have healthy children following possible DU exposures. Medical screening for exposure to DU is offered to ADF personnel considered to be at increased risk of DU exposure, and also to those who request it. (<i>See Health Bulletin No 7/2003 Australian Defence Force Policy on Depleted Uranium Health Screening</i>).
<p>Medical Treatment</p>	<ul style="list-style-type: none"> ➤ The treatment of an individual with a retained DU fragment or piece of shrapnel is based on removal of the fragment. Some projectiles lodge in places where removal is difficult and the surgeon may decide to leave them in place rather than damage surrounding tissue trying to remove them. In that case, continued health monitoring will be required.