

Estimate of the Pulmonary Neoplastic Hazard of Inhaled Depleted Uranium in Gulf War Veterans

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The aim of this study was to evaluate the concentration of inhaled aerosols of depleted uranium oxide in the lungs of Allied Forces Gulf War Veterans during operation Desert Storm. Five British, Canadian, and US veterans were analyzed for the quantitative relationship of four uranium isotopes in the urine, by thermal ionization mass spectrometry. The biological half-life of DU was derived from the Batelle interstitial lung fluid model and the pulmonary DU burden was calculated for time-zero. The total number of alpha radiation events was determined by integrating the value of a 24-hour urinary excretion of depleted uranium from time-zero to the actual measurement time, ten years after exposure. Average 24-hour urinary specimens of five subjects contain 3.27×10^{-2} micrograms of DU corresponding a time-zero inhalation of 0.336 mg of DU with a resulting dose of 0.958 mSv in the first year and 4.86 mSv within ten years. Our values of the upper limit of maximum permissible inhalation dose of total uranium provide a model for the assessment of neoplastic risk of inhaled depleted uranium and warrants further research with a particular reference to pulmonary neoplastic risk of inhaled aerosols of ceramic oxides of depleted uranium.