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## **Medical Effects of Internal Contamination with Uranium**

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The purpose of this work is to present an outline of the metabolic pathways of uranium isotopes and compounds, medical consequences of uranium poisoning, and an evaluation of the therapeutic alternatives in uranium internal contamination. The chemical toxicity of uranium has been recognized for more than two centuries. Animal experiments and human studies are conclusive about metabolic adverse effects and nephrotoxicity of uranium compounds. Radiation toxicity of uranium isotopes has been recognized since the beginning of the nuclear era, with well documented evidence of reproductive and developmental toxicity, as well as mutagenic and carcinogenic consequences of uranium internal contamination. Natural uranium ( $^{238}\text{U}$ ), an alpha emitter with a half-life of  $4.5 \times 10^9$  years, is one of the primordial substances of the universe. It is found in the earth's crust, combined with  $^{235}\text{U}$  and  $^{234}\text{U}$ , alpha, beta, and gamma emitters with respective half-lives of  $7.1 \times 10^8$  and  $2.5 \times 10^5$  years. A special emphasis of this paper concerns depleted uranium. The legacy of radioactive waste, environmental and health hazards in the nuclear industry, and, more recently, the military use of depleted uranium in the tactical battlefield necessitates further insight into the toxicology of depleted uranium. The present controversy over the radiological and chemical toxicity of depleted uranium used in the Gulf War warrants further experimental and clinical investigations of its effects on the biosphere and human organisms.

Key words: actinides; carcinogens; dose-response relationship, Gulf War syndrome; mutagenesis; mutation; nuclear decay; radioactivity; radiobiology; uranium