

Importance of Human Data: U.S. Transuranium and Uranium Registries

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Since 1968, the U.S. Transuranium and Uranium Registries (USTUR) has studied the biokinetics and tissue dosimetry of uranium and transuranium elements in nuclear workers. In 1992, the National Human Radiobiology Tissue Repository (NHRTR) was established at the USTUR. The NHRTR holds biological specimens from USTUR tissue donors, as well as samples from U.S. Radium Studies acquired from Argonne National Laboratory in 1993. The USTUR is not an epidemiology study, however, the materials and data available at the USTUR/NHRTR can be used to improve radiation dose assessment in support of radiation epidemiology. The uniqueness of the USTUR lies in its ability to link thoroughly documented exposure, work history, medical, industrial hygiene, and bioassay data with precise postmortem measurements of the content and distribution of radionuclides in the human body. The USTUR research focuses on: (1) modeling of actinide biokinetics, (2) study of actinide distribution in the human body, (3) quantification of uncertainties in radiation dose assessment and health outcomes, and (4) study of occupational exposure to nonradioactive materials associated with the nuclear industry. The USTUR maintains well-established collaborations with national and international scientists and institutions. As a part of collaboration with the Million Person Study, the USTUR provides tissue analyses results to develop worksite-specific biokinetic models for dose reconstruction. Another topic of special interest, where tissues available at the USTUR/NHRTR can be used, is studying nonuniformity of radiation dose distribution from various radionuclides in individual organs. Data and tissue samples from individuals exposed to beryllium are also available at the USTUR. These can be used to improve the beryllium biokinetic model and investigate potential synergetic effects of beryllium and radiation on tissues.

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