

## Using *In Vivo* Measurements and Urine Bioassay to Characterize the Absorption of Inhaled $^{241}\text{AmO}_2$ and Evaluate the Probability Distributions of Doses

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This paper describes the use of comprehensive urine bioassay and external counting data from an initial 6-y follow-up of an individual who accidentally inhaled  $^{241}\text{AmO}_2$  to evaluate: (i) the probability distributions of parameter values characterizing dissolution and absorption of this material from the lungs; (ii) the probability distribution of a parameter characterizing this individual's rates of transport of intact  $^{241}\text{AmO}_2$  particles from his lungs, and; (iii) the probability distributions of this individual's intake, effective dose and committed tissue dose equivalents. The application of the UK Health Protection Agency's "Likelihood Weighted Latin Hypercube" (LWLH) method utilizing Bayesian inference with the IMBA Professional Plus software to derive these distributions directly from the bioassay data is described. This is an ongoing U.S. Transuranium and Uranium Registries (USTUR) case study of a healthy volunteer registrant. It is now 12 y since the accidental intake occurred. Plans to test the power of the parametric probability distributions derived from the initial 6-y follow-up to predict future bioassay results and updated probability distributions of doses in this case will be discussed. More general application of the probability distributions of  $^{241}\text{AmO}_2$  absorption parameters derived from this case study will also be discussed.

USTUR-0245A-08