

Estimating Uncertainty on Internal Dose Assessments

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The estimation of uncertainty on doses broadly falls into three categories. (1) Estimating the uncertainty on prospective doses. Here, the intake is known and the uncertainties in individual parameter values must be propagated through the calculated dose. (2) Estimating the error or uncertainty on dose assessments made from single measurements. Here, intake, model parameter and measurement uncertainties are propagated into the measurement, but default ICRP parameter values are used to estimate the intake and dose from the measurement. (3) Estimating the probability distribution of an individual's dose from a set of monitoring data. Here, Bayesian inference methods must be used to estimate the uncertainty on the estimated dose. A computer code is being developed that performs all three types of uncertainty analysis using Monte Carlo simulation. The software samples biokinetic parameters from probability density functions and then calculates doses from these parameters by calling the dosimetry code IMBA Professional Plus. A description of the methodology, together with an example application of the software, is included in this paper.

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