

## **The Mayak Worker Dosimetry System (MWDS-2013): Determination of the Individual Scenario of Inhaled Plutonium Intake in the Mayak Workers**

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In order to estimate doses of workers exposed to plutonium, it is necessary to make assumptions about both the route and the time course of intake. The objective of this study was to determine a time course for the inhalation rate for plutonium (intake regime) useful for biokinetic modeling. Records from workplace air sampling, personnel biophysical examinations and autopsy data from former Mayak Production Association (MPA) workers were used. Plutonium accumulation strongly correlated with the volumetric activity of plutonium in workplace air. Using data from activity in air at MPA workplaces over time, a three-step function of intake was adopted. The adequacy of this three-step function was tested by comparing predicted doses using more complicated intake regimes. Uncertainties on the three-step function were also characterized based on air sampling data. The three-step function was assumed to be common to all workers, but an individual intake regime for each worker was calculated by convoluting it with the worker's actual employment history.

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