Overview and Dosimetry of the Hanford Americium Accident Case

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Postmortem examinations of selected tissues from an individual who received a massive internal exposure to ^{241}Am and succumbed to pre-existing cardiovascular disease 11 years later are summarized. Significant findings include acellularity of the marrow, marked peritrabecular fibrosis, and a lack of bone surface remodeling, confirmed by bone-surface alpha-spectrometry; tissue concentrations of ^{241}Am that indicate bone and liver as the primary deposition sites, in general agreement with the new ICRP mode, but not with the older models; a distribution of ^{241}Am in soft tissues in general agreement with that observed in animals; and the absence of any other gross or microscopic pathological findings attributable to the exposure. Cumulative absorbed doses to the bone, bone surface, liver, and lung were 18, 520, 8, and 1.6 Gy, respectively. The probability of not observing a fatal cancer based on BEIR-IV risk factors for these absorbed doses was 12%.

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