FACTSHEETS

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REPOSITORY Livermore LWR
COLLECTION Records Relating to Industrial/Medical
BOX No. Exposure to Radium, Box 121 ASH
FOLDER Binder #33 - CHR Fact Sheets, Review Committees History of CHR from ANL Reports

11/1/76

CENTER FOR HUMAN RADIOBIOLOGY

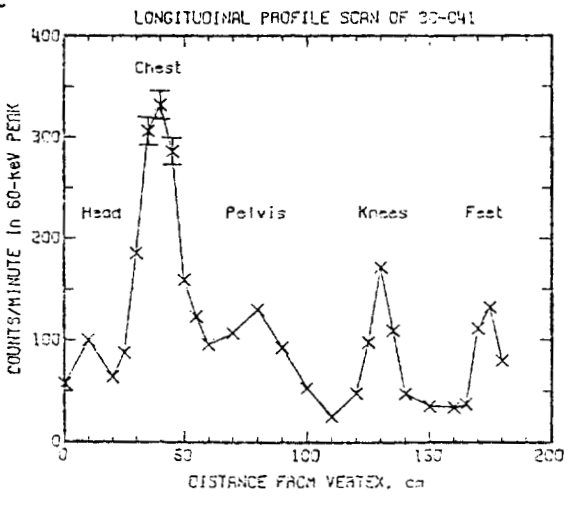
Fact Sheet on

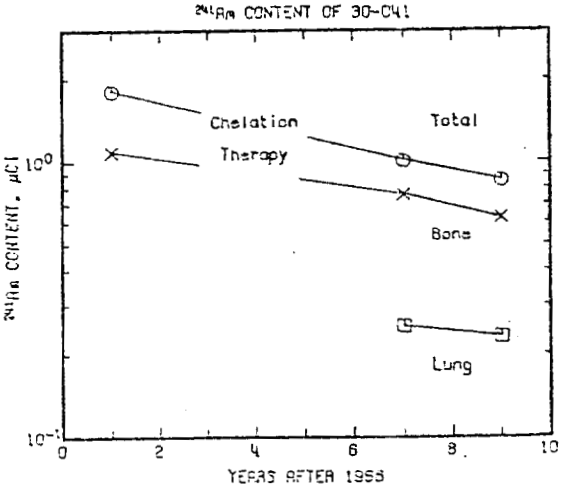
^{241}Americium Studies

The following table summarizes radioactivity measurements of six persons exposed (probably all by inhalation) to the insoluble dioxide. The first two cases are a scientist and his young son who had worked with a supposedly sealed source at home. The remaining four were workers in an industrial plant which manufactured ^{241}Am sources. The maximum permissible body burden is 0.05 μCi.

Case Number	Probable Year of Exposure	Date of Measurement	Body Content (μCi)
30-001	1964	1970	0.06
30-002	1964	1970	0.04
30-044	1966	1974	0.003
30-056	1966	1975	0.003
30-061	1966	1975	0.004
30-041	1966	1967	1.8
		1973	1.0
		1975	0.85

The following figures show the distribution of activity in the body of 30-041 and the decline with time. Retention half-times in excess of five years for both lung and skeleton are indicated. Chelation therapy was given for most of the time between our first and second observations, but not subsequently.





Prepared by R. E. Toohey

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A seventh case accidentally swallowed two small sealed sources of ^{241}Am, of the type used in domestic smoke detectors. The total activity was 4.22 μCi and the sources were voided separately, but not until the 16th and 24th days after ingestion. Less than 1% of the total activity was removed from the foils in which it was incorporated, and was recovered in the fecal matter.

Current Studies:

The calibration of a detector for ^{241}Am is a difficult problem because of the low photon energies involved. Methods of estimating the effective depth of ^{241}Am in the body have been developed and efforts continue to improve the calibration technique.

Future Plans:

The contaminated subjects will be followed up to determine the rate of lung and total body clearance at late times after inhalation and also to observe any changes in the distribution of ^{241}Am in the body. Other subjects who have had potential exposure to ^{241}Am will be examined.

Publications:

Measurements of ^{241}Am in a Ten-Year Old Boy.
J. Rundo, A. T. Keane and H. A. May in Assessment of Radioactive Contamination in Man, Proceedings of a Symposium, pp. 579-594 (I.A.E.A., Vienna) 1972.

An Experimental Method of Estimating the Depth of ^{241}Am Deposited in the Chest.
R. E. Toohey, Health Physics 29, 417 (1975).

Gross Distribution of ^{241}Am in a Man Seven Years after Inhalation.
R. E. Toohey and M. A. Essling in Biological and Environmental Effects of Low Level Radiation, Proceedings of a Symposium, Vol. II, pp. 153-160 (I.A.E.A., Vienna) 1976.

A Rapid Method for Estimating the Effective Depth of Internally-Deposited ^{241}Am.

R. E. Toohey and J. Rundo in Diagnosis and Treatment of Incorporated Radionuclides, Proceedings of a Seminar, pp. 277-281 (I.A.E.A., Vienna) 1976.

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