

Project Name: No Formal Project Name  
Designation: Human Studies

Date Started: May 1965  
Date Terminated: January 1972

Institution:  
Funding Source(s): AEC

710254

Identification:  
Project Duration:  
Principal Investigator(s): C.W. Sill, Health and Safety Division, ID-AEC

Responsible Government Official(s): Charles L. Dunham, M.D.  
John R. Totter, Ph.D.

**Objective(s) of Project:** The determination of the metabolic fate of radionuclides ingested or inhaled by humans in good health, and calibration of both static and rotational scanning instruments for the direct in-vivo measurement at internally deposited radionuclides.

**Short Description:** Eight human volunteers were involved with the human studies endeavor, which consisted of thirteen individual experiments. All of the eight persons involved were employed by the ID-AEC, and all were associated with the Analytical Chemistry Branch of the Health and Safety Division. Four of the experiments involved inhalation of Argon-41 (a noble gas with a half life of 1.8 hours) and nine experiments resulted in the volunteers swallowing insoluble polyethylene capsules containing microcurie amounts of radioactivity. A discussion of the guidelines and philosophy used during these experiments is provided in Reference 1. below. References 2-4 provide discussion of counting methodologies utilizing human volunteers from this human studies project.

**Follow-up Data:** The short half life of Argon-41 and its small residence time in the body resulted in very small radiation doses to the volunteers. The insoluble capsules required about 24 hours to pass through the body and produced very small doses due to the quantities of radioisotopes involved. As a consequence, no follow-up data acquisition was considered necessary.

**References:**

1. IDO-12058, "Some Guidelines for Studies Involving Internal Administration of Radioactive Materials to Human Volunteers," C.W. Sill, Health and Safety Division, ID-SEC, Issued October 1966.
2. J.I. Anderson and D.G. Olsen, "A Rotational Technique for Assessing Quantity and Distribution of Body Radioactivity," Health Physics 13 (1967), pp. 719-732.

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3. D.G. Olson, "A direct Calibration Using Gamma Spectrometry for Measuring Radioactivity in Humans," Health Physics 14 (1968), pp. 439-447.
4. J.I. Anderson and D.G. Olson, "Computerized Helical Scanning to Determine the Location of Specific Nuclides in the Human Body," Health Physics 23 (1972), pp. 325-332.

Attachment(s): References attached.