131 Iodine Therapy: A Brief History

Lewis Braverman, M.D.
Boston University School of Medicine
Letter to Dr. Saul Hertz from Karl T. Compton, Ph.D., President MIT (1930-1948).

December 15, 1936

Dr. A. Hertz
Massachusetts General Hospital
Boston, Mass.

Dear Dr. Hertz:

To my chagrin I have just come across the memorandum which I made on your question about the radioactivity of iodine.

Iodine can be made artificially radioactive. It has a half period of decay of twenty-five minutes and emits gamma rays and beta rays (electrons) with a maximum energy of 2.1 million volts. It is probable that there are several other periods of decay, but if so they correspond to types of radioactivity like the one indicated and they are not as yet very definitely established.

Very sincerely yours,

Karl T. Compton
President

Letter to Karl T. Compton from Dr. Saul Hertz.

December 13, 1936

Professor Karl T. Compton
Office of the President
Massachusetts Institute of Technology
Cambridge, Mass.

Dear Sir:

I received your letter in relation to the radioactivity that can be artificially induced with iodine and believe the data will be of considerable interest to us. However, it is essential to know that iodine which is used radioactively will lose its radioactivity as rapidly as you indicated will be a useful method of therapy in cases of overactivity of the thyroid gland.

Thank you for this information and if animal experiments are undertaken we will communicate the results to you.

Very sincerely yours,

Saul Hertz M.D.
Thyroid Clinic
“...I believe that it is rather different for the situation here with regard to iodine. Our primary interest was in iodine metabolism and when it became apparent that there might be radioactive isotopes of iodine, it at once-occurred to Hertz that we might make use of them to solve a problem that we were already working on...”

-J.H. Means, 1939

Dr. Saul Hertz and an Early Patient.
• “Dr. Saul Hertz has been a professional collaborator and personal friend of our[s] for over six years. Dr. Hertz is an exceptionally able endocrinologist.”

• “Dr. Hertz is the originator of new techniques in endocrinology, especially in the treatment of disabling thyroid disturbances through the use of artificially radioactive isotopes.”

• “With this thought in mind, it would seem highly desirable to the Navy to have Dr. Hertz within the Naval Medical Corps and specifically assigned to the treatment of stubborn endocrinological cases among naval officers and ratings.”

- Robley D. Evans, 1943

The Jewish Advocate, May 23, 1946
$3.40 Goiter Cure Involves Orange Juice, Iodine Isotope

MADISON, Wis., Sept. 13—Dr. Saul Hertz of Harvard Medical School told scientists attending the University of Wisconsin symposium on radioactive isotopes here today of a complete treatment for poisonous goiter which consists merely of taking a dose of radioactive iodine in a glass of orange juice. The iodine is taken up

Boston Sunday Herald, September 14, 1947

Hertz to Use Nuclear Fission in Cure for Cancer

The Harvard Crimson, May 24, 1949
Treatment of Thyroid Carcinoma with Radioactive Iodine I 131

Freedberg, AS, Ureles, AL, Lesses, MF, Gargill, SL

• My father-in-law, Dr. Samuel Gargill, followed up on this suggestion and published one of the earliest reports on the use of radioactive iodine in the treatment of thyroid cancer.

“During the late 1930’s and early 1940’s patients were treated with either 131 I (half life=8 days; 90% of energy beta emission), 130 I (half life 12.5 hours 100% beta emission), or a combination of the two.”

“The first therapeutic dose intended to treat hyperthyroidism was administered to Mrs. ED on March 31, 1941, and contained a mixture of 131 I (10%) and 130 I (90%).”

“Of the eight patients treated with RAI between 1940 and 1941, five received divided doses estimated at 1.5-6.2 mCi (average 3.9 mCi).”

The First Two Manuscripts Describing the Use of Radioactive Iodine in Treating Hyperthyroidism

RADIOACTIVE IODINE IN THE STUDY OF THYROID PHYSIOLOGY USE OF 131 I IN HYPERTHYROIDISM


THE TREATMENT OF HYPERTHYROIDISM WITH RADIOACTIVE IODINE

“...Finally, your verdict (on p. 77) that the credit for priorities in investigations of thyroid function and therapeutics goes to Hertz, Means, and Evans is faulty and inexact, in that implies equal credit. It omits my name entirely. Did you think I was just a glorified lab technician? I made important contributions, not only to the technology of the measurement of uptake and dosages, and for this work received an award of honor from the New England Society of Nuclear Medicine in, I think, 1976. My own allocation of credit, percentage-wise, would be Hertz 80, Roberts 15, Means and Evans 2.5 each...”

- Arthur Roberts, 1991

MIT Symposium 2011

• Saul Hertz (MGH/MIT) pioneered treatment of thyroid cancer using radioactive iodine treatment.

Thank You

• Jeff Garber, M.D.
• Megan Crist
• Barbara Hertz
• Saul Hertz, M.D.