

# Hypothyroidism and Radioiodine Therapy

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## 1. Introduction

Thyroid diseases are the most common endocrinopathies. In the Czech Republic they make up 80 to 90% workload of the endocrine centers. Thyroid diseases requiring treatment or at least follow up affect at least 5% of our population, for women middle-aged and older 10 to 15%.

In some thyroid diseases radioiodine  $^{131}\text{I}$  has been used for treatment.

Hypothyroidism arises most often in the Czech Republic on the basis of chronic autoimmune thyroiditis, hypothyroidism is relatively common as artificial - after surgical or radioiodine therapy (RAIT) of various diseases of the thyroid gland.

## 2. Hyperthyroidism

In hyperthyroidism three major treatment modalities are currently available: antithyroid drugs, radioiodine and surgery, each of which presents advantages and restrictions (Surk et al., 1990). RAIT is considered as the most comfortable and economical approach of hyperthyroidism treatment caused by Graves' disease or toxic nodular goiter. Such treatment is indicated in patients with/or without functional autonomy to normalize thyroid function, and to reduce thyroid volume (Meier et al., 2002).

The therapeutic use of radioiodine to treat hyperthyroidism from Grave's disease was first reported by Saul Hertz in 1941. Hertz administered produced a I-130 - I-131 mixture as a therapeutic dose to the first human patient with Graves' disease at Massachusetts General Hospital. This was the first successful treatment of humans with an artificially produced radioactive material. Gradually a series of 29 patients were treated and documented ([http://en.wikipedia.org/wiki/Saul\\_Hertz#cite\\_note-10](http://en.wikipedia.org/wiki/Saul_Hertz#cite_note-10)). The Journal of the American Medical Association published in May 1946 the paper with results of a five year follow up study of the 29 patients and documented the successful treatment and safety of radioactive iodine for the treatment of hyperthyroidism. The follow-up study firmly launched the use of RAIT as a standard treatment for Graves' disease (Hertz & Roberts, 1946).

RAIT is applied mostly in hyperthyroid adults. However, it has recently gained appreciation also in children (Brown, 2009). In children radioiodine treatment should be considered in recurrent toxic goiter and in cases of ineffective thyrostatic drugs (Cooper, 2003). RAIT of