



# Radiation Oncology Consultants

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## ROC March 2015 Newsletter

### Radioactive I-131 for Thyroid Cancer Patients at Adventist Hinsdale Hospital



#### Radioactive I-131

Thyroid cancer is one of the most common endocrine malignancies. Surgery is the primary treatment of localized thyroid cancer. Following surgery, radioactive iodine (RAI), also known as I-131, may be recommended for adjuvant therapy.

Iodine is an essential component of the thyroid hormones [triiodothyronine](#) (T3) and [thyroxine](#) (T4), and it is required for proper thyroid function. RAI is available in liquid or capsule form and when taken, it concentrates in the thyroid cells and can destroy any residual thyroid tissue or residual microscopic disease. Multiple large retrospective studies have demonstrated a significant decrease in recurrences and disease-specific mortality with RAI.

#### Indications

The 2009 ATA (American Thyroid Association) guidelines recommend RAI for all patients with distant metastases, gross extrathyroidal extension, and tumor size greater than 4 cm. It is also recommended for select tumors 1-4 cm with documented lymph node metastases or higher risk features including aggressive histologic variants (tall cell, columnar, insular, solid variants or poorly differentiated

carcinoma), presence of intrathyroidal vascular invasion, gross or microscopic multifocal disease, or age > 45y. RAI is not recommended for unifocal cancer < 1 cm without high risk features or for multifocal cancer when all foci are < 1 cm without high risk features.

The 2014 NCCN guidelines are similar to the ATA guidelines. They additionally recommend RAI for patients with post-operative unstimulated thyroglobulin levels > 5-10 ng/mL and if there is extensive vascular invasion. They do not recommend RAI if the primary tumor is < 2 cm, intrathyroidal, no vascular invasion, clinically N0M0 disease, if the postoperative unstimulated Tg (thyroglobulin) is < 1 ng/mL in the absence of interfering anti-Tg antibodies.

### **Treatment/ Dosing**

Preparation of a patient for RAI therapy is critical to increase the efficacy of the therapy. For 1-2 weeks prior to treatment, a low-iodine diet is recommended and thyroid replacement medication is held. An alternative option is to administer thyrogen (rhTSH) to avoid the morbidity of hypothyroidism. Randomized studies have demonstrated that thyroid hormone withdrawal and rhTSH stimulation are equally effective preparations for RAI therapy.

There are 3 different methods to dose I-131: empiric fixed doses, quantitative dosimetry, and upper bound limits set by blood dosimetry. The fixed dose method is the most widely used and the simplest. The majority of clinics, including our department, use this method.

The ATA guidelines recommend the minimum activity necessary (30-100 mCi) to achieve successful remnant ablation for low-risk patients. For certain low-risk patients, randomized data have demonstrated that 30 mCi of RAI is equivalent to 100 mCi. According to the NCCN guidelines, for patients with T1b/T2 (1-4 cm), clinical N0 disease, 30 mCi of RAI is recommended if needed. It also may also be considered for patients with T1b/T2 (1-4 cm) with small volume N1a disease (fewer than 3-5 metastatic lymph nodes < 1 cm in diameter) and for patients with primary tumors < 4 cm, clinical M0 with minor extrathyroidal extension.

If residual microscopic disease is suspected or if there is a more aggressive histology, then higher activities (100-200 mCi) may be appropriate. Patients with distant metastases are usually treated with 200 mCi.

### **Post Treatment Management/ Side Effects**

At Adventist Hinsdale Hospital, the patients are given RAI therapy as an outpatient if they are able to minimize contact with others for 7 days after treatment. They are provided with instructions on radiation safety and given precautions to reduce exposure to others.

Temporary and potentially permanent side effects discussed with the patient include nausea, parotitis, dry mouth, altered taste, menstrual cycle disturbances, and risk of a secondary malignancy.

\*For more information or to refer a patient for treatment, please contact Radiation Oncology at Adventist Hinsdale Hospital – 630-856-7350.

## References

Cooper DS, Doherty GM, Haugen BR, et al. Revised American Thyroid Association Management Guidelines for Patients with Thyroid Nodules and Differentiated Thyroid Cancer: The American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer. *Thyroid* 2009; 19(11): 1167-1214.

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Dagan R, Amdur RJ. Thyroid Cancer. *Clinical Radiation Oncology* 2013; 918-937.