

# Risk of Second Primary Malignancy in Patients Treated with Radioactive Iodine for Thyroid Cancer

K McNamara<sup>1</sup>, Veronica Barry<sup>1</sup>, Alexander Yao<sup>2</sup>, Joanne Weekes<sup>3</sup>, Thomas Saunders<sup>4</sup>, Churunai Hari<sup>1</sup>, and Devashish Tripathi<sup>3</sup>

<sup>1</sup>Princess Royal Hospital NHS Trust

<sup>2</sup>Manchester Royal Infirmary

<sup>3</sup>New Cross Hospital

<sup>4</sup>Royal Stoke University Hospital

February 7, 2021

## Abstract

**ABSTRACT** Introduction Radioactive iodine (RAI) is widely used as a treatment for differentiated thyroid cancer following total thyroidectomy. There is a risk of second primary malignancy (SPM) in these patients which is estimated between 0-5% although research to support this is limited. The primary aim of this study was to ascertain the rate of SPM in patients who have undergone RAIT for thyroid cancer. The secondary objectives were to assess whether the risk is dose dependant and examine the overall survival and recurrence rates. Methods A retrospective review of all patients treated with radioactive iodine for thyroid cancer between 2002 and 2014. Patient information was collected from a structured database. Data regarding second cancers and recurrence rates was obtained from an online clinical portal. Follow up was 5 years minimum. Results 199 patients underwent RAI treatment. Median age was 53. 71.4% patients were female and 28.6% were male. All patients underwent total thyroidectomy. 13.6% underwent total thyroid and central neck dissection. 11% underwent total thyroidectomy and lateral neck dissection. 5.5% required post-operative radiotherapy. 12% patients developed recurrent thyroid cancer. 8% developed a SPM of which prostate, skin, head and neck SCC were the most common. A dose  $\geq 3.7$  (Gigabecquerel) GBq was statistically significantly more likely to lead to a SPM with a P value of 0.041 (95% CI -0.52 – 0.01318). Conclusions Increased risk of developing a second primary malignancy should be taken into account, especially in younger patients with low risk disease, when deciding on RAIT. Key words Radioactive iodine, Differentiated thyroid cancer, Second primary malignancy, Radioiodine, Thyroid cancer

## Hosted file

RAI Main Document Clin Otol.pdf available at <https://authorea.com/users/394268/articles/507686-risk-of-second-primary-malignancy-in-patients-treated-with-radioactive-iodine-for-thyroid-cancer>

## Hosted file

RAI table 1.pdf available at <https://authorea.com/users/394268/articles/507686-risk-of-second-primary-malignancy-in-patients-treated-with-radioactive-iodine-for-thyroid-cancer>

## Hosted file

RAI Table 2.pdf available at <https://authorea.com/users/394268/articles/507686-risk-of-second-primary-malignancy-in-patients-treated-with-radioactive-iodine-for-thyroid-cancer>

## Hosted file

RAI Table 3.pdf available at <https://authorea.com/users/394268/articles/507686-risk-of-second-primary-malignancy-in-patients-treated-with-radioactive-iodine-for-thyroid-cancer>