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**EFFECTIVE HALF LIFE OF  $^{131}\text{I}$  IN THYROID CANCER  
PATIENTS**

**A PROJECT REPORT PRESENTED BY**

**NAALINI LOGANATHAN**  
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*in partial fulfillment of the requirement  
for the award of the degree of*

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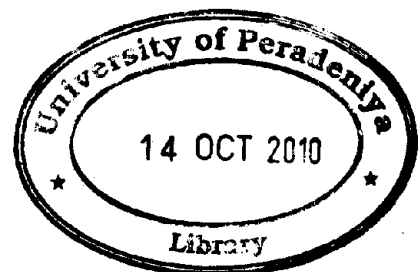
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# EFFECTIVE HALF LIFE OF $^{131}\text{I}$ IN THYROID CANCER PATIENTS

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The oral administration of radioactive  $^{131}\text{I}$  is a standard treatment for thyroid carcinoma. Sufficiently long physical half-life (8.04 days) and beta-emission (364 keV) of  $^{131}\text{I}$  coupled with its efficient localization by the thyroid tissue provides a basis for use in the treatment of thyroid cancer. Regulatory guidance recommends the use of biological elimination as well as physical decay in calculating the confinement time to keep the effective dose equivalent to members of the public less than 5 mSv. Limits on the doses are recommended on calculations based only on the physical decay of the  $^{131}\text{I}$ . However as the thyroid tissues of these patients have either been surgically removed or ablated by prior doses of  $^{131}\text{I}$ , the body compartments that would retain the iodine are relatively small and the effective half life ( $T_{\text{eff}}$ ) of  $^{131}\text{I}$  which combines the physical and biological decay could be short. Even so the practice at the National Cancer Institute (NCI) Maharagama is to discharge the patients after 5 days. This study reports on an analysis of a patient database of 60 administrations of  $^{131}\text{I}$  for thyroid cancer. 50% of the patients gave an effective half life in the range 21 -25 h. Patients treated at the NCI with 100 – 200 mCi are released only after 5 days. 56 patients in this study group gave dose equivalent values less than 5 mSv at the end of the third day so that they could be released after 3 days. However the ideal situation would be where discharge criteria for radiation safety purposes should be calculated on the basis of individual measurement.