

UR  
L  
Y

**CLINICAL DOSIMETRY OF TRANSMISSION FACTORS FOR  
HARD WEDGES AND SHIELDING TRAYS USED IN T 780 E  
TELECOBALT MACHINES AND ITS FEATURES**

A PROJECT REPORT PRESENTED BY

THIRUNAVUKKARASU YOGANATHAN

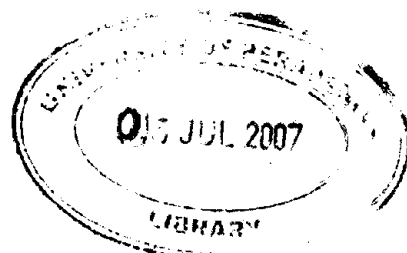
to the Board of Study in Physics of the  
**POSTGRADUATE INSTITUTE OF SCIENCE**

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

**MASTER OF SCIENCE IN MEDICAL PHYSICS**

of the

**UNIVERSITY OF PERADENIYA  
SRI LANKA  
2006**



**607470**

# CLINICAL DOSIMETRY OF TRANSMISSION FACTORS FOR HARD WEDGES AND SHIELDING TRAYS USED IN T 780 E TELECOBALT MACHINES AND ITS FEATURES

**T.Yoganathan**

Post Graduate Institute of Science

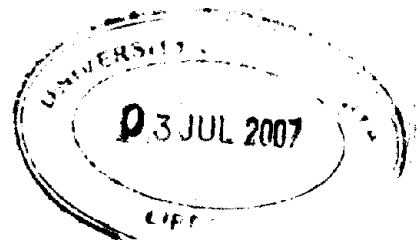
University of Peradeniya

Peradeniya

Sri Lanka

In this study, three hospitals have been selected for this research project work, those hospitals are Badulla General Hospital, Kandy General Hospital and Tellippalai District Hospital. Brand of Theratron 780 E telecobalt machines manufactured by MDS Nodion, Canada were used in three centers, as well as sets of wedges supplied by same vender. Wedge factors for different wedges were worked out and plotted against square field sizes. According to the measurements, wedge factors linearly increased with square field sizes for a particular wedge and shows nearly same wedge factor values for all centers. The important features of telecobalt machines are discussed including development history of telecobalt machines.

Collimator scatter factors and shielding tray factors (beam shaping tray factors) were also measured for different field sizes. It was observed that collimator scatter factor linearly increased with field sizes from  $5 \times 5 \text{ cm}^2$  to  $20 \times 20 \text{ cm}^2$  at 80 cm SSD, due to the scatter radiation directly received by the sensitive volume of the ionization chamber. For large field sizes, scatter radiation due to the collimator and head assembly was not received by sensitive volume of the ionization chamber. Therefore the graph of scatter factor against field size becoming saturated hence formed a curve.



Two shielding trays were used for tray factor measurements. Those were plain and slotted trays. Based on the results of measurements those trays factors varied with different field sizes within 2% and 0.67% respectively. Therefore, for routine clinical work only one tray factor can be used for all the field sizes.