

**RADIATION DOSE MEASUREMENT AND ACCURACY OF LINEAR
ACCELERATOR (LINAC) UTILIZING THERMOLUMINESCENT
DOSIMETER (TLD) AND IONIZATION CHAMBER**

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14311040

BACHELOR'S DEGREE

in

ELECTRICAL ENGINEERING-
BIOMEDICAL ENGINEERING CONCENTRATION

FACULTY OF LIFE SCIENCES AND TECHNOLOGY

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August 2015

Revision after the Thesis Defense on 5th August 2015

STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

RADIATION DOSE MEASUREMENT AND ACCURACY OF LINEAR ACCELERATOR (LINAC) UTILIZING THERMOLUMINESCENT DOSIMETER (TLD) AND IONIZATION CHAMBER

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It is widely known that radiation therapy is used for treating cancer. One of the modalities for treating cancer is linear accelerator (LINAC) which utilizes high frequency electromagnetic waves to accelerate charged particles through a linear tube. However it is important to maintain the accuracy of output produced by LINAC. As stated in TRS-398, the requirement for accuracy in radiation therapy should be $\pm 5\%$ of the prescribed dose. This research is aimed to measure the radiation dose and accuracy from LINAC in $10 \times 10 \text{ cm}^2$ radiation field using ionization chamber and TLD chips in 6 MV, 15 MV, 6 MeV, and 9 MeV energy levels. In photon and electron beam, measurement using ionization chamber, the range of error was small from 0 Gy to ± 0.2024 Gy. On the other hand, the range of error in the measurement using TLD chips was higher from ± 0.0001 Gy to ± 0.3912 Gy. In conclusion, measurement using TLD chips had slightly higher errors compared to the measurement using ionization chamber.

Keywords: radiation therapy, linear accelerator, ionization chamber, thermoluminescent dosimeter, radiation dose.



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DEDICATION

I dedicate this work for my parents and my sisters



ACKNOWLEDGEMENTS

First, I have to thank my thesis advisor Mr. M. Fathony, Ph.D. Without his assistance and dedicated involvement in every step throughout the process, this thesis would have never been accomplished.

Second I would like to thank all MRCCC staffs especially Mrs. Rina Taurisia, MSc as my co-Advisor who always assisted me until I could finish my bachelor thesis.

I wish to thank staffs from BATAN; Mrs. Dyah, Mrs. Helfi, and Mrs. Yati who allowed me to use the TLD chips facility.

To my hilarious friends from Biomed-11, I thank you very much for our irreplaceable four years and for every up and down we have experienced. To my juniors Irda Wandira and Nathania Renata, thank you for the laughter and joy we have shared together. To Evita, Isabella, Jessica, Michelle, and Yuki, I thank you very much for always being there to support me.

To Raka Ardi, thank you for always offering your encouragement and never letting me give up on my work.

Most importantly, none of this could have happened without my parents and my sisters. I am forever grateful for having all of you who always support and encourage me unconditionally.

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