بسم الله الرحمن الرحيم

أقرأ باسم ربك الذي خلق خلق الإنسان من علق
أقرأ ورزبُك الأكرم الذي علم بالقلم علم الإنسان ما
لم يعلم

صدق الله العظيم

سورة العلق
Dedication

This thesis is dedicated to:

Soul my father

My mother

My brothers

My sisters

My family

My teachers

And to my friends
Acknowledgment

My faithful thanks and praise to Allah for providing me with health and strength to conduct this study. I would like to express my deep gratitude with special respect to my Supervisor Dr. Hussein Ahmed Hassan who gave me much of his time for suggestion and careful supervision during this period, to product this study. I wish to extend my thanks to Private Medical Institution. Lastly, I am also so grateful for Mr. Omer Mohammed Elhadi Babiker and to every person helped me in gathering information and guiding me in making this study.
Abstract

The aim of this study is to evaluate the of beam alignment of x-ray tube accuracy in the Khartoum hospitals, this study include 12 x-ray machines in 12 hospitals. The accuracy of radiation was tested and the most important results obtained that the alignment is 91.7% & misalignment is just 8.3% in along cassette, and 75% in across cassette 25% misalignment. in the central ray the alignment reached 83.3 % & misalignment 16.7%.

This study confirms that x-ray machine in the Khartoum state hospitals operate at a good level.
الملخص

الهدف من هذه الدراسة تقييم دقة تطابق شعاع انبعاث الاشعة السينية في مستشفيات ولاية الخرطوم.

شملت هذه الدراسة 12 جهاز اشعة سينية في 12 مستشفى. تم اختبار دقة تطابق الشعاع.

وقد وجد أن نسبة التطابق وصلت إلى 91.7 بالمائة ونسبة عدم التطابق 8.3 بالمائة على طول الفيلم. وعلى عرض الفيلم قد بلغت نسبة التطابق 75 بالمائة ونسبة عدم التطابق 25 بالمائة. أما في وسط الفيلم بلغت نسبة التطابق 83.3 بالمائة ونسبة عدم التطابق 16.7 بالمائة.

تؤكد هذه الدراسة أن أجهزة الإشعة السينية في مستشفيات ولاية الخرطوم تعمل بمستوى جيد.
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**List of abbreviation**

**QA** : Quality Assurance

**QC**: Quality Control

**SID**: Source to image distance
LBDs: light beam diaphragms

FFD: focal film distance

AAPM: American Association of physicists in Medicine

AL1 + AL2: Total along cassette misalignment in cm

AC1 + AC2: Total across cassette misalignment in cm

CFR: Code of Federal Regulation

mAs: milliAmbere second

KVP: Kilovolt peak

BLD: Beam lighting device

CR: Computed Radiographer

NCRP: Nuclear commission radiation protection