بِسْمِ ٱللَّهِ ٱلرَّحْمَٰنِ ٱلرَّحِيمِ

ٱقْرَأْ بِٱسْمِ رَبِّكَ ٱلَّذِى خَلَقَ ۝ خَلَقَ ٱلْإِنسَٰنَ مِنْ عَلَقٍ ۝

ٱقْرَأْ وَرَبُّكَ ٱلْأَكْرَمُ ۝ ٱلَّذِى عَلَّمَ بِٱلْقَلَمِ ۝ عَلَّمَ ٱلْإِنسَٰنَ مَا

لَمْ يَعْلَمْ ۝

صدق الله العظيم

سورة العلـــق

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, Iam also so grateful for *Mr. OmerMohammed ElhadiBabiker* 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 انبوب الاشعة السينية في مستشفيات ولايةالخرطوم

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

وقد وجد ان نسبة التطابق وصلت الى 91.7بالمائة ونسبة عدم التطابق 8.3بالمائة على طول الفيلم , وعلى عرض الفيلم قد بلغت نسبة التطابق 75بالمائة وعدم التطابق 25بالمائة, اما في وسط الفيلم بلغت نسبة التطابق 83.3 بالمائة وعدم التطابق 16.7بالمائة.

تؤكد هذه الدراسة ان اجهزة الاشعة 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