

## الآية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ  
أَقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ ﴿١﴾ خَلَقَ الْإِنْسَانَ مِنْ عَلَقٍ ﴿٢﴾  
أَقْرَأْ وَرَبُّكَ الْأَكْرَمُ ﴿٣﴾ الَّذِي عَلَّمَ بِالْقَلَمِ ﴿٤﴾ عَلَّمَ الْإِنْسَانَ مَا

لَمْ يَعْلَمْ ﴿٥﴾

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, 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.

## المخلص

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

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

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

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