**قال تعالي :**

﴿ وَعِندَهُ مَفَاتِحُ الغَيْبِ لاَ يَعْلَمُهَا إِلاَّ هُوَ وَيَعْلَمُ مَا فِي البَرِّ وَالْبَحْرِ وَمَا تَسْقُطُ مِن وَرَقَةٍ إِلاَّ يَعْلَمُهَا وَلاَ حَبَّةٍ فِي ظُلُمَاتِ الأَرْضِ وَلاَ رَطْبٍ وَلاَ يَابِسٍ إِلاَّ فِي كِتَابٍ مُّبِينٍ ﴾

سورة الأنبياء الاية ﴿59﴾

﴿ وَيَسْئَلُونَكَ عَنِ الرُّوحِ قُلِ الرُّوحُ مِنْ أَمْرِ رَبِّي وَما أُوتِيتُمْ مِنَ الْعِلْمِ إِلاَّ قَلِيلًا﴾

سورة الإسراء الاية ﴿85﴾

# Dedication

*Every challenging work needs self-efforts as well as guidance of elders*

*especially those who were very close to our heart.*

*To those of the fingers to give us a life of happiness.*

*My humble effort I dedicate to my sweet and lovely mother, who guided me*

*from the first step on and never let me fall…*

*To the soul of my dear father*

*To My Dear husband, and My sweet Baby*

*To my brothers, sisters, friends, and to all my family.*

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## Abstract:

This study aims to evaluate of patient radiation dose in chest x-ray using Entrance surface dose calculations, the study was done in two hospitals Alshab Teaching Hospital and Ibrahim Malik Teaching Hospital in Khartoum state, Entrance surface dose (ESD) was determined from exposure settings and patient information using mathematical equation .

220 patients were examined in this study, The entrance surface doses (ESDs) to patient undergoing chest X-ray radiography Exposure settings and patients data were recorded. Result concerning the kilovoltage (KVp) and tube current (mAs) and focus to film distance (FFD) settings. The variation in the patient doses and techniques used for the examinations studied were found among the different hospitals denoting the importance of establishing a national quality assurance programme and examination protocols to ensure patient doses are kept as Low as possible. Mean ESDs obtained for chest radiography in Alshab Teaching Hospital recorded in this study was ( .125 $\pm$0.04) mGy and Mean ESDs obtained for Lumbar spine radiography in Ibrahim Malik Teaching Hospital recorded in this study was (4.39 $\pm$1.23) mGy.

الملخص:

تهدف هذه الدراسة إلى تقييم الجرعة الإشعاعية للمرضى في كشف الأشعة السينية للصدر باستخدام حسابات الجرعة عند السطح , وقد أجريت هذه الدراسة في مستشفى الشعب التعليمي ومستشفى إبراهيم مالك التعليمي في ولاية الخرطوم . تم تحديد الجرعة عند السطح من إعدادات التعرض ومعلومات المريض باستخدام معادلة رياضية

تم فحص 220 مريض في هذه الدراسة وتم تسجيل إعدادات التعرض ومعلومات المريض والجرعة عند السطح للمرضى تحت فحص الأشعة السينية للصدر , النتائج تتضمن معلومات المريض الطول والوزن والجنس والعمر وإعدادات التعرض جهد الأنبوب وتيار الأنبوب والزمن .

تم ملاحظة الإختلاف في الجرعات للمرضى التقنيات المستخدمة للفحوصات المدروسة التي وجدت بين مختلف المستشفيات تشير إلى أهمية تأسيس برنامج تأكيد جودة قومي وبروتوكولات الفحص الإشعاعي للتأكيد أن جرعة المريض محفوظة أقل ما يمكن . وجدت الجرعة عند السطح المتحصلة عليها من هذه الدراسة في مستشفى الشعب التعليمي

(0.04 $\pm$ .125) وفي مستشفى إبراهيم مالك التعليمي (1.23 $\pm$ 4.39) ملي قري

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# List of abbreviation

| | |
|---|---|
| CR | Computed Radiography |
| DR | Digital Radiography |
| ATH | Alshab Teaching Hospital |
| ICRU | International commission radiological unit. |

| | |
|---|---|
| FS | Film Screen |
| AP | Anterior posterior |
| PA | Poster anterior |
| LAT | Lateral |
| HVL | Half Value Layer |
| PSP | Photo stimulated phosphor |
| TLD | Thermolumensecence Detector |
| PMT | Photomultiplier tube |
| ESAK | Entrance Surface Air Kirma |
| ESD | Entrance Surface Dose |
| FSD | Film Skin Dose |
| ALARA | As Low As Reasonable Achievable |
| ICRP | International Commission on Radiological Protection |
| NRPB | National Radiation Protection Board |