



Sudan University of Science and Technology
College of graduate studies

***Calculation of Surface Dose for the Adult Patients
of Some Common Diagnostic X ray Examination***

حساب الجرعة السطحية للمرضى البالغين في بعض

حالات التشخيص بالأشعة السينية

***A Thesis submitted in partial fulfillment for the requirements
of M.Sc Degree in Physics***

By

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Dedication

To..

**My Family,
My Teachers,
My Friends,
M y Colleges,
My Students.**

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Abstract

In this study, Entrance Surface dose (ESD) were estimated for adults patients undergoing common X ray examinations in two Hospitals in Khartoum, namely Khartoum teaching hospital and academy teaching hospital. the study was performed in four X ray machines.

A total of 191 patients were included in this study. Patient's data such as (age and weight) and exposure parameters (kV and mAs) were recorded. The results of ESD have been obtained with the use of the Dose Cal software which developed by the radiological protection center in saint gorges hospital London.

The results showed that the mean values for chest, abdomen and limbs were 0.31 mGy, 2.6 mGy, 0.05 mGy respectively.

the results obtained in this work range from (10.3) for lumbo_sacral lat to (0.004) for Elbow was not exceeding the reference value and also the values obtained by Previous studies as shown in table (4-40), but When compared between the four machines by selected some tests, the mean dose value at Khartoum teaching hospital by (shimadzu (1)) was found to be higher than other machines this may be for these reasons because it is old one and also its output is greater than outputs of other machines, but in general the efficiency of technicians in Khartoum teaching hospital is less than in the academy teaching hospital, and also the number of patients in this hospital is more than academy hospital.

المخلص

في هذه الدراسة تم حساب الجرعة السطحية للمرضى البالغين الذين تلقوا اختبارات تشخيصية بالأشعة السينية لفحوصات مختلفة في كل من مستشفى الخرطوم التعليمي والمستشفى الأكاديمي التعليمي بولاية الخرطوم بالسودان .

تضمنت الدراسة أربعة وحدات اشعة وكان العدد الكلي للمرضى 191 مريض .

تم تسجيل البيانات الخاصة بالمرضى (العمر والوزن) وكذلك عوامل التعريض (الجهد ومضروب التيار

في الثانية).

تم حساب الجرعات الإشعاعية لكل من صور الأشعة الماخوذة باستخدام برنامج كمبيوتر (dose cal)

الذى تم تصميمه في مركز الوقاية من الأشعاع في مستشفى سانت جورج بلندن.

النتائج توضح ان القيم المتوسطة لكل من الصدر والبطن والاطراف هي :

0.31 mGy, 2.6 mGy, 0.05 mGy

علي التوالي.

النتائج التي تم الحصول عليها من هذه الدراسة تتراوح بين 10.3 في حالة lumbo_sacral lat الي 0.004 في حالة Elbow لا تتعدى القيم المرجعية وكذلك بعض الدراسات التي اجريت في السودان سابقاً كما موضح في جدول (4-40).

وعند المقارنة بين الاجهزة الاربعة وجد ان جهاز(1 shimadzu) في مستشفى الخرطوم التعليمي قد سجل اعلي قيمة جرعة سطحية وذلك قد يعود للأسباب الاتية , وجد انه اقدم جهاز من بين الاجهزة الاربعة وكذلك output لهذا الجهاز اكبر من output للجهاز الاخرة ,

وبصورة عامة العاملين في مستشفى الخرطوم اقل كفاءة من العاملين في المستشفى الأكاديمي ,
كما ان عدد المرضى اكبر في مستشفى الخرطوم وذلك يقلل من كفاءة الجهاز .