

الآية

قال تعالى: "قل لو كان البحر
مدادا لكلمات ربي لنفد البحر قبل ان
تنفذ كلمات ربي ولو جئنا بمثله مددا
"

صدق الله العظيم

سورة الكهف الاية ١٠٨

Dedication

- ❖ *To the candles that burn to light my way, my lovely parents.*
- ❖ *My father, who made all the cheap and precious for the sake of my arrival to this stage, my father thanks.*
- ❖ *My family's love, patience, and support were essential to the completion of this research.*
- ❖ *To my lovely husband who was stand behind me to complete this work.*
- ❖ *To my friends and my colleagues.*
- ❖ *To my medical physics family .*
- ❖ *I dedicate this work to you.*

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List of abbreviations

RICK:	radiation and isotope center of Khartoum.
QA:	Quality Assurance
QC:	Quality Control.
ESTRO:	European Society for Therapeutic Radiation Oncology
WHO:	World Health Organization
IPEM :	Institute of Physics and Engineering in Medicine
ALARA:	As low As Reasonable Achievable
PTV:	Planning Target Volume
ISL:	Inverse Square Law
SSD:	Source Skin Distance
ICRU:	International Commission on Radiation Units.
LINAC:	Linear accelerator
COINW:	Clinical Oncology Information Network.
LASER:	light amplification stimulated of emission radiation.
SDD:	source diaphragm distance
SAD:	source axial distance
IMTR :	intensity modulated radiation therapy.
PDD:	percentage depth dose.
TAR:	tissue air ratio.

Abstract

The current study carried out in Radiation and Isotopes Center in Khartoum to assess ⁶⁰Co-teletherapy unit performance, in which they the front pointer, graphic paper, Pin, non screen film and check plate were used to obtain the measurements.

The results reveal that there is a difference between the theoretical FS and the measured one in relation to the change of SSD; and the average difference was 1.1 cm

Also from the correlation between the QC field size (practical measurement) and inverse square law (theoretical) field size which is given by using Myneord Factor, there is 0.4 cm as excess value in practical measurement relative to theoretical method.

Also there were shift in the collimator, couch and gantry angel isocenter versus variability in SSD, angel of diaphragm rotation respectively which was ± 1.1 , ± 1.3 , 0.003 cm respectively. Also the study reveal that the scale meter SSD has a shift of 0.8 cm greater than the actual measured one and determined by front pointer. Moreover the scanning of the exposed film revealed that the penumbra profile was 2 cm and the laser beams incongruence at the isocenter was 1.1 cm.

الخلاصة

لقد تمت الدراسة في المركز القومي للعلاج بالاشعة والطب النووي لتقدير اداء جهاز الكوبالت-٦٠ للعلاج عن بعد باستخدام افلام أشعة ، ورقة رسم بياني ، محدد المسافة ، مقياس عتامة .

ولقد وجد ان هناك انحراف في حقل الإشعاع للجهاز مقارنة بحقل الإشعاع النظري في مختلف المسافات بين المركز للجهاز و المريض مختلفة وكان الإنحراف ١.١ سم وايضا هناك خطأ في حجم المجال اذا قورن بقانون التربيع العكسي بمقدار ٠.٤ وايضا هناك خطأ في ضبط المركز مع المحدد،وزاوية الطاولة،الفتحة التي تحتوي المصدر وكلها بالنسبة للمسافات مختلفة من المصدر للسطح ولقد وجد ان الخط علي التوالي (١.١، ٠.٣، ٠.٠٣، ٠.٣ cm

(

وايضا هناك خطأ في المسافة من المصدر للسطح الحقيقية من المسافة من المصدر للسطح المحسوبة بمقدار ٠.٨ سم كما وجد ان إمتداد شبه الظل لمصدر الإشعاع خارج نطاق الحقل الإشعاعي ٢ سم . و مقدار الإنحراف في تقاطع حزمة الليز كانت ١.١ سم .