

الاية

قال تعالى:

و قل إعملوا, فسيرى الله عملكم و رسوله و)
المؤمنون,
وستردون إلي عالم الغيب و الشهادة فينبئكم بما
(كنتم تعملون

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Dedication

This thesis is dedicated to

My father,

My mother,

Brothers & sisters

Friends

And above all my teachers

List of Abbreviations

ANZSNM	Australian and New Zealand Society of Nuclear
Medicine	
Atm	Atmospheric
Bq	Becquerel

C E N	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
Ci	Curi
CNEN	National Commission of Nuclear Energy
DTPA	Dithylen penta acidic acid
ETSI	European Telecommunication Standards Institute
IAEA	International Atomic Energy Agency
IEC	International Electrotechnical Committee
ISO	International Standardization Organization
LCI	Calibration Laboratory of institute
MAA	Macro Aggregated Albumin
NM	Nuclear Medicine
NEMA	National Electrical manufacturers Association
NRC	Nuclear Regulatory Commission
QA	Quality Assurance
QC	Quality Control
WHO	World Health Organization

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Abstract

Nuclear medicine uses many different radioactive isotopes for radiation diagnostics studies and for therapy. The amount of radioactivity has to be determined exactly before it is applied to a patient. The dose calibrator has to measure the radioactivity of gamma and beta with different energies precisely for high quality imaging and for applying the right amount of radiation to treat diseases.

This study was carried out to assess the performance of dose calibrator which is used in nuclear medicine department in Elnielin Medical Diagnostic Center (Khartoum state). The study period was from July 2014 to February 2015. Four quality control tests were carried out using standard radionuclide, ^{137}Cs . The tests included accuracy, constancy, linearity and geometry. All results that were obtained from the study were compared with the international standard ($\pm 5\%$) and the results showed that the dose calibrator under the study is of good performance and there is no need for any correction tables or factors or maintenance for the time being.

المستخلص

يتم استخدام النظائر المشعة بمختلف الانواع فى الطب النووى لاجراء الفحوص الطبيه التشخيصية ولعلاج بعض الامراض . وينبقي ان يتم تحديد الجرعات الاشعاعية لهذه الاغراض قبل اعطائها للمريض . ويلعب مقياس الجرعه دورا كبيرا في هذا المجال حيث يقيس الجرعات لاشعه قاما وبينا ذات الطاقات المختلفه بصوره

دقيقه للحصول علي صور ونتائج ذات جوده عالية . وقد تم اجراء هذه الدراسة لتقويم اداء جهاز قياس الجرعة بمركز النيلين التشخيصي بالخرطوم في الفترة من يوليو 2014 وحتى فبراير 2015 . وقد تم اجراء اربعة اختبارات اساسية باستخدام السيزيوم 137 , واشتملت علي اختبار الدقة , الثبات , والخطية والشكل الهندسي للجهاز . وقد تمت مقارنة النتائج مع المعايير العالمية (± 5 %) , حيث اتضح ان الجهاز المعني يعمل بصورة جيدة ولا يحتاج الي جداول تصحيح أو صيانة في الوقت الحاضر .

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