

**Abstract - ID: 34**

**Author(s):** Mohamad Aminudin Said (**Presenter**), Institut Kanser Negara

**Are you an invited speaker/presenter to ICRM2018?:** No

**Title:** The comparison between two different methods to determine resident time for Lu-177 Dotatate therapy.

**Abstract:**

*Radionuclide therapy using Lutetium-177 radioactive material (Lu-177) is a treatment option for neuroendocrine tumor cancer patients. However, this treatment would have risks the patient's kidney due to the Lu-177 retention in patients kidney. The study was conducted at the Department of Nuclear Medicine, Institut Kanser Negara (IKN) which involved data on the treatment of 13 patients. Radionuclide therapy starts with 7.2 GBq 177-Lu injected to the patient and followed with whole body image scan performed by using gamma camera at 0.5, 4, 24, 48, and 72 hours post administrations. The determinations of resident time for kidneys were used trapezoid method and the least squares method and compared with the standard reference method. Through the Mann-Whitney U test, three point trapezoidal methods ( $U = 80.5$ ,  $p = 0.837$ ), 5 point tri-exponents ( $U = 64.5$ ,  $p = 0.305$ ), and tri-exponent 3 points ( $U = 61.0$ ,  $p = 0.228$ ), statistically indicates that there is no significant difference in the value of resident time between both method with a standard reference. Based on the Lin Concordance correlation, the Rc value of the 3-point trapezoid method was 0.910 indicating a very close agreement with the standard reference method compared to the 5-point tri-exponent method ( $Rc = 0.854$ ), and 3-tri exponential ( $Rc = 0.782$ ). In conclusion, this study has shown that the 3-point trapezoidal method is closest to the standard reference method and absorbed dose is at a safe level.*

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**Category:** Nuclear Medicine

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#### **Abstract - ID: 37**

**Author(s):** Zaheer Chiragh (**Presenter**), Gurayat General Hospital  
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**Are you an invited speaker/presenter to ICRM2018?:** No

**Title:** Dual-Phase  $^{99m}\text{Tc}$ -MIBI Scintigraphy in Lymphoma as a Predictor of Response to Chemotherapy

#### **Abstract:**

**Introduction:** Lymphomas (Hodgkin's disease and Non-Hodgkin's lymphoma) belong to a group of malignant diseases that carry a high cure rate. Failure of chemotherapy is, however, a major problem faced by treating physicians. **Aims and Objectives:** The aim of the study was to assess the role of dual-phase  $^{99m}\text{Tc}$ -MIBI scintigraphy in response prediction in patients receiving chemotherapy for malignant lymphomas and to correlate uptake ratios and Retention Index % (RI%). **Materials and Methods:** Histologically proven Lymphoma patients belonging to all age groups and both sexes were included in the study. Dual-phase  $^{99m}\text{Tc}$ -MIBI scintigraphy (pre-chemotherapy) was performed at 10 minutes and 3 hours. **Results:** A total of 24 patients (17 males, 7 females) suffering from both Hodgkins Disease (8) & Non-Hodgkins Lymphoma (16), aged 8 – 80 years were enrolled in the study. Pre-chemotherapy tumor/background ratios (T/B ratios) and RI% were calculated from the 25 lesions visualized by  $^{99m}\text{Tc}$ -MIBI scintigraphy. CT scan picked up 32 lesions.  $^{99m}\text{Tc}$ -MIBI scintigraphy picked up 81% (25/32) of the lesions in total. The diagnostic accuracy in supra-diaphragmatic regions was 86% (26/29). Patients were evaluated for chemotherapy response at the end of 3 cycles and CT scan was done to determine the reduction in lesion sizes. A cutoff value for RI% was determined to be 79% to differentiate between good

responders and poor responders. RI% of responders was  $86.6 \pm 11.8\%$  &  $60.0 \pm 12.9\%$  in non-responders. **Conclusion:** Dual-phase  $^{99m}\text{Tc}$ -MIBI scintigraphy can be a helpful, non-invasive tool to predict the response to chemotherapy in patients of malignant lymphomas.

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### Abstract - ID: 93

**Author(s):**

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**Are you an invited speaker/presenter to ICRM2018?:** No

**Title:** PATIENTS WITH IMPAIRED RENAL FUNCTION AND RADIOIODINE ABLATION THERAPY: RISKS AND IMPACT ON GUIDELINES

**Abstract:**

I-131 is eliminated predominantly through renal clearance. There is no consensus on the ideal dose of I-131 for patients with impaired kidney function. We aim to compare the rate of I-131 clearance in patients with impaired renal function to the normals.

Method: 27 cases (34 treatments) of differentiated thyroid cancer and eGFR 15-59 ml/min/1.73 m<sup>2</sup> received I-131 (mean dose of 150 mCi) for remnant ablation between 2010 and 2016. Another 34 patients matched for age, gender, weight and I-131 dose with eGFR  $\geq$  60 ml/min/1.73 m<sup>2</sup> were selected as control. Endpoints of interest were (a) Length of hospital stay (LOHS) until the patient's I-131 activity declines to < 30 mCi (b) at 48 hours after treatment (ER 48). Paired t-test was used to compare both groups

Results: Mean LOHS for cases vs. controls was 2.47 vs. 2 days respectively (P=0.007). Results of ER 48 were available and matched in 18 cases and controls. Mean ER 48 for cases vs. controls was 3.74 vs. 1.8 mR/h respectively (P=0.002).

The mean proportional reduction of exposure rate after 48 hours compared to hour 0 for cases and controls was (-88% vs. -92.6%, P=0.008), (-93.5% vs. -94.5%, P=0.5) and (-67.2% vs. 94.3%, P=0.04) for eGFR 46-59 (n=13), 30-45 (n=3) and 15-29 ml/min/1.73 m<sup>2</sup> (n=2) respectively.

Conclusion: Patients with impaired renal function are subject to longer hospital stay and delayed renal clearance of the tracer with consequent increased radiation exposure. Guidelines should consider adjusting the dose of I-131 in these patients to avoid possible harmful effects of excess I-131 on vital organs.

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**Abstract - ID: 336**

**Author(s):** Yousif Mohamed Y. Abdallah (**Presenter**), Department of Radiological Sciences and Medical Imaging, College of Applied Medical Sciences, Majmaah University, Majmaah 11952, Saudi Arabia  
Marwa Selmi, College of Applied Medical Sciences, Majmaah University

**Are you an invited speaker/presenter to ICRM2018?:** Yes

**Title:** A Precise Improvement of Nuclear Cardiology Images Using Equivalent-Computing Methods

**Abstract:**

Nuclear Medicine consider of one of the most important tool in analysis of heart diseases. In ischemic cardiac patients, the recognition closely adjacent tissues is very crucial process because of the noise that affected both image quality and sharpness. This study conducted to study the cardiac images improvement using segmentation transform as computing choice in order to increase the diagnostic accuracy in diagnosis of cardiac diseases. Many image-processing techniques were used to improve the images including Using PARFOR, Laplacian Filtering, Edge-aware and Granulometry Algorithm. The results of the study showed PARFOR and Edge-aware filter better results rather than Granulometry filters and define the heart myocardium margins precisely.

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**Abstract - ID: 407**

**Author(s):** Alaa Bashir (**Presenter**), Sudan Academy of Science (SAS) - Atomic Energy Council

**Are you an invited speaker/presenter to ICRM2018?:** Yes

**Title:** Estimation of Effective Dose to patients using Voxelized Mathematical Models in Nuclear Medicine Examinations

## Abstract:

The risk from ionizing radiation special the low-dose from nuclear medicine it's not determined clearly, this study aimed to determine the effective dose from diagnostic nuclear medicine in Sudan, were the Data collected from three nuclear medicine department (Al-Nileen Medical Diagnostic Center, Royal Care International Hospital, and Al-Mak Nimer University Hospital), the Collected patient's data and activity administered during diagnostic procedures and rules applied to adjust these a cording to the patient's parameters such as age, weight, and gender, were the data collected from 271 patients. The results show's that the calculated effective dose and absorbed dose by OLINDA/EXM 2.0 software, calculated values compared to other calculation methods (MIRD 2.0, and DOSISRAD software). The Mean of effective dose from nuclear medicine procedures (1.310E-01, 4.74E-03, and 2.17) mSv for thyroid, (2.05E-03, 5.93E-04, and 4.13) mSv for bone, and (1.19E-02, 1.20E-03, and 1.07) mSv for renal scan using OLINDA/EXM 2.0, MIRDOSE 2.0, and DOSISRAD software's respectively. This disparity between calculated values by using DOSISRAD software and the other calculated methods due to DOSISRAD designer according to simple spherical phantom (all body approximately as unit density), as for the OLINDA\EXM and MIRDOSE designer according to Hybrid phantom and Voxel phantom respectively. The mean effective dose calculated from all examinations for all centers found less than the threshold of international organization and some countries. The use of the new voxelized phantoms has generated new effective dose estimation. These results are expected to lead to more realistic estimates of radiation risks in nuclear medicine compared.

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**Abstract - ID: 434**

**Author(s):** Loyal Jambi (**Presenter**), University of Leicester  
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Aik Ng, University of Nottingham  
Alan Perkins, University of Nottingham

**Are you an invited speaker/presenter to ICRM2018?:** No

**Title:** Development of small field of view hybrid gamma camera for intra-operative imaging

**Abstract:**

**Introduction:** The development of hybrid imaging in medical diagnosis offers new applications for intraoperative nuclear imaging. A new concept for nuclear diagnostic imaging is presented, the Hybrid Gamma Camera (HGC). It is a novel handheld gamma camera with optical imaging capabilities, developed at the Space Research Centre, University of Leicester in collaboration with the University of Nottingham.

**Materials and Methods:** The HGC consists of a charged coupled device (EMCCD), a 1500 $\mu\text{m}$  thick CsI(Tl) columnar scintillator with a tungsten pinhole collimator which gives a 40x40mm<sup>2</sup> nominal field of view for an 8x8mm<sup>2</sup> CCD detection area. An optical camera is aligned so as to provide the same field of view as the gamma camera. Gamma and optical images are obtained simultaneously and fused to produce dual-modality images providing functional information from the gamma camera with anatomical details from the optical camera. Images were acquired in laboratory simulations using a range of phantoms. Clinical images from patients attending the clinic were also taken.

**Results:** The characteristics of the HGC compared favourably with other portable SFOV cameras currently in use. A spatial resolution of approximately 1.5mm was recorded. Initial laboratory phantom simulations and clinical investigations from lymphoscintigraphy and thyroid imaging demonstrated a new way of visualising uptake, with good localisation of the site of activity in patients.

**Conclusion:** The HGC could be used at the patient bedside and in operating theatres. The combination of an optical and a gamma camera, in a co-aligned configuration, provides an optical image overlaid with a scintigraphic image.

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**Please provide details:** European Association of Nuclear Medicine EANM 2016, Barcelona, Spain as an electronic poster

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