

conversion coefficients for each acquisition condition. This standardization is also important for identifying appropriate thresholds for differentiating high and low risk heart failure patients. In addition this cross-calibration would enable a better comparison between European and Japanese data.

OP217b

Audit on staff exposure when administering Radium 223 Dichloride Therapy

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Background: Prostate cancer is the fourth most common cancer in both sexes combined and the second most common cancer in men. In 2012 an estimated 1.1 million men worldwide were diagnosed with prostate cancer according to the World Health Organization. Radium dichloride therapy (^{223}Ra) has a half-life of 11.4 days which emits short-range alpha-particles with high-energy that selectively targets areas of increased bone turnover such as bone metastases. A range of methods to administer ^{223}Ra have been reported from using protective suits with face masks to more commonly personal protective equipment such as gloves and aprons. This audit intends to evaluate our current practice with regards to staff exposure and method of administration of ^{223}Ra . **Materials and Methods:** Since 2004 we have been involved with administering ^{223}Ra . We currently perform an average of four patients a week (clinical and research). Data from 18 administrations was collected over a period of 3 months. Specialized techniques, such as two staff members for therapy administration, use of personal protective equipment (double gloves, apron and Inco pad sheets) are current practice when administering the therapy within our general Nuclear Medicine Service. Administration is currently performed under the Ionising Radiations Regulations 1999 (IRR99) by a team of four experienced members of staff (two clinical nurse specialists; two nuclear medicine research technologists). The average patient activity was 4.35 MBq of ^{223}Ra , ranging from 3 MBq - 6.7 MBq. A dose meter was used at a 50 cm distance from the syringe (approximate distance from administrator to syringe) as well as Electronic Personal Dosimeter (EPD). **Results:** Our data showed the average dose rate from administering the therapy was 3.67 $\mu\text{Sv/hr}$ (± 1.4). No EPD readings were observed for all 18 administrations. The room monitoring (injection chair; trolley and surrounding areas) and self-monitoring were both not significant. **Conclusion:** This audit confirmed that according with the methods and practices used in our service, most Nuclear Medicine Departments can potentially deliver this treatment, providing adequate staff training is in place as well as good communication with all teams involved. ^{223}Ra can be administered with safety for both patients and staff involved.

OP218

Design and Development of a Dedicated Robotic SPECT System for Cardiac Imaging

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Introduction: Cardiac imaging has become an integrated part in the diagnostic and prognostic work-up of patients with cardiovascular disease. In order to improve the quality of cardiac imaging dedicated cardiac scanners with small field of view introduced in last couple of years. We designed and developed a dedicated cardiac SPECT system in our lab for cardiac imaging called RoboSPECT. This name was chosen because of robotics motions of detectors and arms in this scanner. The reclining seat design of the scanner provides maximum patient comfort. It should be noted two perpendicular detector heads designed and optimized for cardiac imaging. The aim of this study is to introduce the concept design of the scanner and also evaluates and characterizes the performance of RoboSPECT based on NEMA-NU2 2007 standards for gamma cameras. **Method:** The detector of the scanner is based on NaI(Tl) crystal and 24 rectangular PMTs (76x76 mm) in 4x6 form cover the detection area. Rectangular shape of PMT allows the full coverage of active crystal area without any dead zone. The scanner equipped with LEHR lead Parallel-hole collimators with 1.5 mm hexagonal holes, 35 mm hole length, and 0.2 mm septal thickness. The gantry of the scanner is based on robotic motion of both arm and detectors that fixed in 90 degree position. All readout electronic in the detector designed based on our US patient called non linear recursive filter. **Results:** The experiments showed that the intrinsic spatial resolution was 3.6 mm on the surface of crystal. The system spatial resolution and the sensitivity of the system on the collimator surface were 7.8 mm and 179 cps/MBq, respectively. The extrinsic energy resolution was determined as about 9.3 %. In addition, the integral uniformity and the differential uniformity, after uniformity correction, in UFOV were measured 2.2% and 1.2%, respectively. Also the absolute and differential linearity were evaluated 0.8 and 0.1 mm in UFOV. In order to validate the accuracy of images acquired by this scanner 50 patients were scanned both with RoboSPECT and ADAC camera. The results showed good agreement between the images of both scanners. **Conclusion:** This study showed that the designed scanner called RoboSPECT has acceptable performance for cardiac imaging.

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Do.MoRe: Thyroid & Parathyroid

OP219

Role of single-nucleotide polymorphisms (SNPs) of glucose transporter 1 (GLUT1) in differentiated thyroid cancer (DTC) patients

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Aim: The human genome has about 35 million SNP. Some SNP are more common than other. Our aim was to identify SNP, which are presented more frequently in patients with DTC or which change for the worse of this disease. GLUT1 is up regulated in solid tumors like DTC and patients with higher standardized uptake values (SUV) on F-18-FDG (FDG)-PET show a poorer prognosis. For this we evaluated the effect of the three mostly reported SNP XbaI, HpyCH4V and HaeIII for the GLUT1 on progression free survival and overall survival in DTC patients. **Methods:** A total of 69 patients (P) with DTC and a follow-up of minimum 60 months were included in this retrospective study. All these patients had archival tumor free tissues for SNP analyses. Restriction fragment length polymorphism (RFLP) technique was used to identify SNP. Progression was defined as either increasing Tg-values and/or progress on imaging. FDG-PET was performed for all P and SUVmax was used to quantify glucose uptake. Kaplan Meier curve was made for progression-free and overall survival. **Results:** The allele frequencies were: XbaI G>T: G=0,37 , T=0,63; HpyCH4V A>T: A=0,15 , T=0,85; HaeIII T>C: