with RP-HPLC. The log P and biodistribution in mice at 2 and 60 min p.i of [^{11}C]-***1*** were studied. Calcium imaging experiments, using fura-2 as dye, were performed with HEK293 cells expressing hTRPV1 to determine the IC_{50} of ***1***. **Results.** ***1*** was shown to act as an antagonist of hTRPV1. Ca^{2+} responses to 100 nM capsaicine were inhibited in a concentration-dependent manner, with an IC_{50} of ± 180 nM. The log $P_{octanol/buffer}$ value of [^{11}C]-***1*** was 1.82, suggesting that it may cross the BBB. After intravenous injection in mice, brain uptake was high (2.3% ID at 2 min p.i.) and wash-out was rapid (0.2% ID at 60 min p.i.). [^{11}C]-1 was also efficiently cleared from plasma (2 min: 4.7% ID; 60 min: 0.5% ID), mainly by the hepatobiliary pathway. **Conclusion.** N-(3-hydroxyphenyl)-4-chlorocinnamide (***2***) was synthesized and efficiently labeled with carbon-11 to obtain compound [^{11}C]-***1***, which has favourable biodistribution characteristics in normal mice. Work is in progress to further evaluate the biological properties of [^{11}C]-***1***. A µPET study in rats and metabolite study are in progress.

OP415
[^{18}F]-fludarabine for PET imaging of lymphoma

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Background [^{18}F]-FDG PET a functional and metabolic imaging tool has taken a major position in the pretreatment staging, restaging, therapy monitoring as well as post-therapy surveillance of lymphoma. However, the observed results remain sometimes equivocal, depending, among other criteria, on the histological subtype of the lymphoma, leading to false negative results in low grade lymphomas (SLL, MALT). Moreover, the lack of specificity of [^{18}F]-FDG leads to false positives in the case of increased glycolysis. Therefore there is an unmet need for a more specific tracer that would overcome these problems. **Aim** The aim of our work was to develop from fludarabine, a drug used in low-grade non-Hodgkin's lymphoma treatment, a novel PET radiopharmaceutical ([^{18}F]-fludarabine) and evaluate its potential in preclinical studies. **Methods** fludarabine was labelled with [^{18}F]-KF *via* the substitution of the corresponding 2-nitro derivative followed by deprotection, HPLC purification and formulation. The radiotracer was injected in a) normal mice (controls), b) SCID mice (displaying lymphoid depletion), and c) SCID mice bearing human xenografted RL lymphomas, for in vivo evaluation by microPET and biodistribution after dissection. **Results** [^{18}F]-fludarabine was efficiently synthesized (60% yield decay corrected, radiochemical purity>99%). In animals studies, data revealed at 60min post injection - in controls a relatively high uptake in lymphoid organs such as the spleen (9.2%±0.03ID/g), - in SCID mice this uptake is strongly reduced (2.2%±0.3ID/g) - in xenografted SCID mice a maximum tumor uptake is reached after 20min with an higher degree in tumor (6.6%±0.6ID/g) *versus* others organs at 60min. **Conclusion** An efficient method for the radiosynthesis of [^{18}F]-fludarabine was developed. The preliminary biological evaluation as a new PET tracer for lymphoma is very promising.

1304 - Tuesday, October 13, 2009, 11:30 - 13:00, Hall 117

Technologists Oral Session 3

T17
Study of the Influence of Patient Hydration in Bone Scintigraphy

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Introduction Bone Scintigraphy is a noninvasive and very sensitive Nuclear Medicine diagnostic method in detecting early bone lesions. Between the important technical details to consider when dealing with patient preparation there is the hydration level. The aim of this study is focused on assessing the value of hydration on clinical image quality of bone scans. Material and Methods Fifty five patients (30 females and 25 males, aged between 30 to 80 years old, with an average age of 61,6 years) with indication to perform bone scintigraphy were imaged and previously divided into three groups according to the level and moment of hydration: group 1 (3 females and 3 males) with insufficient hydration (below 500 mL); group 2 (15 females and 12 males) with hydration (21 mL/kg) after radiopharmaceutical administration; group 3 (12 females and 10 males) with hydration (7 mL/kg; 45 minutes) before and after (21 mL/kg) radiopharmaceutical administration. Each patient received 740 to 925 MBq of 99mTc-HDP and whole body images were acquired 2.5 to 3 hours after using standardized acquisition parameters. Regions of interest (ROI) were drawn in the diaphysis of the left femur, on soft tissue of the right lower limb and externally to the right knee (background ROI). Bone/soft tissue ratio, bone/background ratio and soft tissue/background ratios were calculated. Statistical analysis was performed using a test of hypotheses for the difference between means in independent samples and the chi-square test to investigate in each group, the relation/dependence of bone/soft tissue ratio and the gender of patients. Results There are statistical significant differences between the three groups of patients concerning the average bone/soft tissue ratio in three groups (u1 = 2.8859; u2 = 3.3864; u3 = 3.4264). Concerning chi-square test we found that bone/soft tissue ratios are independent of the gender (X2 (df) of 0.5985). Conclusion Based on these results it is possible to conclude that bone/soft tissue ratio in fact increases with the level of hydration and so the related image quality. Furthermore, we found that starting hydration even before radiopharmaceutical administration can help to improve image contrast and image quality.

T18
Optimization of injected F18-FDG patient dose using NECR curve to individual patient scans

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Aim: Patient dose for F18-FDG is mostly administered calculated as a standard dose per kg patient weight. Modern PET-scanners are introduced with terms as 'half dose imaging' or 'half time imaging'. However, the NECR curves of a PET-scanner show where the scanner is functioning optimal. Aim is to objectively calculate the patient dose to be administered based on the NECR of the PET scanner. Methods: NECR curves and values of the PET-scanner (Siemens Biograph 40 TrueV) were measured according to the NEMA NU-2 2007 protocol. F18-FDG patient studies were acquired with a standard patient dose of 3,5 MBq / kg with a standard protocol of 4 min / bed position. Totals and delayed randoms counts were recorded in separate sinograms. For each patient and bed position, with exception of the head region, an individual NECR curve is calculated similar to [1]. Patient length, weight, body mass index (BMI) and dose were registered The dose which should give optimal response was determined retrospectively. Correlations between the proposed optimal dose and given patient parameters were calculated. Results: Different to [1] is the use of a new generation PET-scanner. Also we found out that the individual patient scatter fraction is not relevant due to normalisation of the NECR curve. Further we used the individual totals sinogram to create the masks. The NECR of this PET scanner is much higher than the one used in [1]. Images were reported of good clinical quality. The individual patient NECR was found to be at 66% of maximal NECR. Injected dose was accordingly at 33% of dose at maximum NECR. We found a higher correlation of calculated dose with weight than with BMI. Conclusions: The methodology developed allows estimating injected dose by patient weight, adapted to the NECR curve of the scanner. This estimated injected dose is at 66% of the maximum NECR of the scanner. Dose reduction results in operating at lower percentages of the maximum NECR. Image quality phantom studies are necessary to determine the achievability of this dose reduction. References: [1] Watson et al; Optimizing Injected dose in clinical PET by accurately modelling the counting-rate response function specific to individual patient scans, JNM 2005, 46, 1825-1834

T19
Staff radiation dose during cardiac PET examinations with Rubidium 82

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Aim Myocardial perfusion PET-CT with Rb-82 is a promising diagnostic tool newly available in Europe. Our aim was to estimate radiation dose to staff involved in rest-stress myocardial perfusion studies with Rb-82 PET-CT in our center. Materials & methods We considered 4 different "worker" categories (physician, technologist, nurse and "quality controller"). The physician controls the infusion device that delivers the eluted activity, being present in the PET room during stress and rest acquisition. The nurse prepares the patient for ECG and arterial pressure monitoring, and is present in the PET room during stress and rest acquisition. Both the physician and the nurse stood >2-3m away from the patient during and shortly after the Rb-82 infusion, when possible. The technologist installs the patient on the PET-CT, and controls the acquisition from an adjacent room. Additionally, a quality controller verifies the conformity of the eluate once a day, performing 3 to 4 blank elutions before allowing the system to be used in patients. Each staff member had a personal digital torso dosimeter. Measurements were discarded as soon as FDG was present in the PET unit or a staff member had to leave the controlled area during the procedure. Results Staff exposure was measured during clinical examinations of 32 patients. All patients received the same activity for stress and rest (1600 MBq). Measured doses per elution for each "worker" category are presented in following table.

	Mean ± SD (uSv)	MIN - MAX (uSv)
Quality controller	0.61 ± 0.36	0 - 1.5
Physician	1.05 ± 0.62	0.17 - 2
Technologist	0.02 ± 0.06	0 - 0.17
Nurse	0.38 ± 0.25	0 - 0.75

Conclusion The radiation dose remains small, even for the physician standing in the injection room during Rb-82 infusion. The physician dose for a stress-rest study is similar to those obtained by other groups for Tc-99m-MIBI stress-rest scintigraphy. Doses to physician and nurse might be further reduced using a shield or stressing the importance of increasing the distance from injection device and patient after injection. As expected, doses to technologists who stay in the shielded control room are very low.

T20
Comparing three stress test protocol in Myocardial Perfusion Imaging: patient's tolerance and image quality

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Aim: Adenosine is commonly used for pharmacologic stress testing in Myocardial Perfusion Imaging (MPI). However, this vasodilator agent may cause several side-effects and has been associated with an increased subdiaphragmatic tracer uptake that may interfere with image interpretation and overall test quality. The aim of this study was to compare stress induced by treadmill exercise, adenosine and adenosine plus low level treadmill exercise in terms of side effects referred by patients and to evaluate the corresponding image quality. ***Materials & Methods:*** One hundred and two (102) patients that underwent MPI were divided in three groups according to the stress test performed: Group 1 - Treadmill exercise (n=23); Group 2 - Adenosine infusion (n=57); Group 3 (n=22) - Adenosine infusion combined with low level treadmill exercise. Each group was further divided according to the presence or absence of side effects, their number and the need to administer pharmacologic therapy to control symptoms: A -No side effects; B - One side effect; C - two or more side effects and/or pharmacologic therapy needed. Image quality was evaluated according to the requirement of a new stress acquisition due to