of completion of radiotherapy in both study arm and placebo arm and reported. 2 patients progressed during therapy and were not included in analyses and two patients discontinued the intervention. A per protocol analyses was done.

Results: At analysis there were 50 patients in each arm. The severity of clinical proctitis was found to be similar in both groups of patients with 12.2 % of patients experiencing toxicity of grade 2 and above in digestible starch group versus 14.6% in the resistant starch group. Functional proctitis was similarly graded and it was found that 16.3 % patients in digestible starch group experienced toxicity against 10.2 % patients in the amylase resistant starch group. This difference was seen at 4th week and continued in the subsequent weeks till the end of radiation. Both groups had similar reported toxicity at 6 weeks post intervention. Both groups were also found to have similar incidence of grade 2 and above diarrhea. The non-digestible starch group was found to have 8% incidence as compared to 2% in the other group at the 5th and 6th week. The short chain fatty acid concentrations were found to be not significantly different in the groups at any point.

Conclusion: The study failed to demonstrate a benefit in administration of resistant starch in excess of normal diet to patients receiving pelvic radiotherapy. This may be postulated to be due to concurrent use of chemotherapy and decrease in intestinal probiotics.

PV-0125 Chemoradiation+surgery vs chemoradiation+BRT in advanced cervical carcinoma: a case-control study

Purpose or Objective: To compare treatment outcomes in locally advanced cervical carcinoma (LACC) patients treated with neoadjuvant chemoradiation followed by radical surgery (surgery group: SG) versus radical chemoradiation plus brachytherapy boost (control group: CG). Results in terms of local control (LC), metastases-free survival (MFS), disease free survival (DFS) and overall survival (OS) were compared.

Material and Methods: Seventy-six patients with LACC (SG) were matched to 76 patients (CG) with respect to age, histology and stage. Matching was performed without knowledge of outcomes. Patients characteristics are summarized in Table 1. The median FU was 35 months (range: 2-107) for SG and 29 months (range: 1-125) for CG, respectively.

Results: At univariate analysis no significant differences between the two groups were recorded. Two-year and 5-year LC were 77.6% and 71.0% for SG and 76.1% and 70.3% for CG (p=0.8), respectively. Two-year and 5-year MFS were 79.3% and 70.8% for SG and 78.8% and 78.8% for CG (p=0.6), respectively. Two-year and 5-year DFS were 71.9% and 61.6% for SG and 66.1% and 61.0% for CG (p=0.8), respectively. Two-year and 5-year OS were 90.9% and 84.4% for SG and 90.3% and 69.9% for CG (p=0.4), respectively.

Conclusion: The two treatment approaches achieved comparable outcomes in patients with locally advanced cervical carcinoma. Further analyses are needed to compare the toxicity profile of these two treatment strategies.
It is well known that MR data contains detailed information with high tissue contrast and that PET imaging gives molecular/biochemical information with high molecular sensitivity but what is the added value? A major goal with treatment planning is to delineate the tumor volume, which can be done with both MR and PET, but since the both modalities show different characteristics of the tumor the volume might differ between them. Challenges from the imaging point of view will be discussed. The availability to PET/CT is much higher and the challenges with this method are fewer. Some comparison of the two hybrid modalities will be done. The majority of PET studies are done with the tracer fluorodeoxyglucose, FDG, but beyond FDG a large number of tracers are available, all giving information about different biochemical properties of the tumor. A few of these tracers will be presented and discussed.

SP-0127
MR-PET for radiation oncology: the sub-volume opportunities
D. Thorwarth¹
¹University Hospital Tübingen Eberhard Karls University Tübingen, Tübingen, Germany

Purpose: To investigate the value of combined PET/MR imaging for biologically individualized radiotherapy (RT) planning.

Methods: Hybrid PET/MR imaging offers the possibility to combine molecular information from PET with high resolution anatomical MR imaging. Consequently, a combination of the two different imaging data sets seems promising for improved automatic target volume delineation (TVD). An automatic co-segmentation algorithm has been developed in our institution which derives probabilities of tumor presence by combining PET and MR data. Finally, the PET/MR-based probability maps are segmented to generate RT target volumes. Automatically segmented target volumes were compared to manual delineations from three experienced radiation oncologists. Furthermore, combined PET/MR imaging allows to assess PET and functional MR data at the same time. In the context of a clinical study, diffusion weighted (DW) as well as dynamic contrast enhanced (DCE) MRI were acquired in addition to anatomical images as well as FMISO and FDG PET images. Pairwise correlations of the different functional parameters were calculated in order to analyze for redundancy or complementarity respectively.

Results: Automatic co-segmentation of tumor volumes based on combined FDG PET/MR imaging in head and neck cancer revealed robust and reproducible contours. The comparison of automatic and manual target volumes showed good agreement in terms of volume overlap. Deviation of the automatic compared to the manual contours was in the same order of magnitude as inter-observer variation. Compared to PET-based TVD, additional information from high resolution MR data improves automatic segmentation. A pairwise correlation analysis of parameters derived from FMISO PET, FDG PET, DW- and DCE-MRI on a voxel-level did only show moderate to low correlation coefficients hinting at a complementarity of the different investigated imaging methods. However, large inter-patient variations in terms of pairwise parameter correlations were observed.

Conclusion: Functional and molecular imaging with combined PET/MR has the potential to improve TVD. At the same time, PET/MR allows to assess different levels of biological information which may in the future be important to derive individualized measures of radiation sensitivity. As a consequence, PET/MR imaging opens new doors for personalized RT planning and delivery in the near future.

SP-0128
MR-PET for radiation oncology: the implementation issues
T. Nyholm¹
¹Uppsala University, Immunology - Genetics and Pathology, Uppsala, Sweden

imaging is fundamentally important in modern radiotherapy. For several of the most common diagnoses both PET and MR provide important information in the clinical decision making at the radiotherapy department. The combination of PET and MR in integrated PET/MR scanners could be the most efficient imaging modality for these patients. PET/MR has however primarily been designed for diagnostics and adjustments are needed to enable effective use in radiotherapy. This includes for example the ability to image the patient in treatment position, the ability to account for immobilization devices in the attenuation correction, and the development of adequate quality assurance methods.

OC-0129
Nitroglycerin decreases the hypoxic fraction of non-small cell lung cancer lesions
B. Reyment¹, C.M.L. Zegers¹, W. Van Elmpt¹, F. Mottaghy², A. Windhorst¹, A. Van Baardwijk¹, S. Wanders¹, J. Van Loon¹, D. De Ruyscher¹, P. Lambin¹
¹MAASTRO clinic, Radiotherapy, Maastricht, The Netherlands
²Maastricht University Medical Centre, Nuclear Medicine, Maastricht, The Netherlands

Purpose or Objective: Nitroglycerin is a nitric oxide donor being investigated because of its potential to increase tumour oxygenation. In phase II trial NCT01210378 nitroglycerin is added to radical radiotherapy in patients with NSCLC stage IB-IV. Using a dedicated hypoxia PET tracer ([18F]HX4; ref: Dubois et al, Proc Natl Acad Sci USA.2011) we investigate the effect of nitroglycerin on tumour hypoxia. Here, we report the results of the first 14 patients that completed the hypoxia scanning program.

Material and Methods: A baseline [18F]HX4 PET scan (4h p.i.) was performed to measure hypoxia in the primary tumour and nodes. At least 48 hours later, a second [18F]HX4 PET scan was taken after application of a nitroglycerin patch (Transiderm nitro 5 mg). Between the two scans, patients did not receive any treatment. The primary tumour and involved nodes were defined on the planning FDG-PET-CT scan and fused with the HX-4 scan for analysis. The tumour-to-blood ratio (TBR) of [18F]HX4 and the Hypoxic Fraction (HF; the fraction of the volume with a TBR >1.4) were calculated for all lesions. The Wilcoxon signed rank test was used to evaluate differences between scan time points.

Results: In 14 patients, the median interval between the scans was 4.5 +/-2.1 days (range: 2-7days). Seven patients (50%) exhibited hypoxia (HX-4 TBR>1.4) in the primary tumour and 4 of 10 patients (40%) had nodal disease with an HX4 TBR>1.4 in the lymph nodes. In total 9/14 patients (64%) showed hypoxia at baseline in the primary tumour and/or the lymph nodes. The effect of nitroglycerin on HX-4 uptake in hypoxic lesions was as follows: in 8/11 volumes (72%) and in 6/9 patients (66%) nitroglycerin administration resulted in a decrease of the TBR of HX-4. Also, the median HF decreased from 12.9% to 1.2% (p=0.029), corresponding to a decrease in the median hypoxic volume of 5.4 cc to 0.5 cc (p=0.033). In the 7 non-hypoxic tumours and 6 non-hypoxic nodal volumes present at baseline, nitroglycerin caused a decrease of the TBR of HX-4 in 5, an increase in 5 and no effect in 3 lesions. None of the non-hypoxic lesions became hypoxic (TBR >1.4) after administration of nitroglycerin.