Table 1 - Multivariable Cox PH regression of the clinical variables and blood-biomarkers fitted on the validation dataset, after a feature selection made by LASSO, by including the offset of the re-calibrated linear predictor and allowing for a selection among the new blood-biomarkers. Performance of the model expressed in terms of internal Harrell's c-index, corrected for optimism by a 10-fold CV (between brackets).

Feature	Hazard Ratio	95% CI HR	p-value	c-index
Calibrated PI	2.4	1.7 – 3.5	<0.01	
α2M	4.6	1.3 – 16	<0.01	0.67
sIL2R	3.1	1.1 – 9.2	<0.01	(0.66)
VEGF	1.4	0.8 – 2.4	0.3	

Conclusion: In conclusion, we improved and validated a clinical model with inclusion of hypoxia and tumor-load related blood-biomarkers. New immunological markers were associated with overall survival. Currently we are aiming to extend these models to include imaging information (Radiomics).

PO-0679
Comparison of toxicity and outcome in stage III NSCLC patients treated with IMRT or VMAT
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Purpose or Objective: Intensity-modulated radiation therapy (IMRT) and volumetric-modulated arc therapy (VMAT) are widely used in the treatment of advanced stage non-small cell lung cancer (NSCLC). These techniques deliver conformal dose distributions at the cost of increased target dose heterogeneity (particularly IMRT) and larger volumes of surrounding healthy tissues receiving low doses (particularly VMAT). We evaluated whether these dosimetric differences between IMRT and VMAT are of influence on treatment toxicity and outcome.

Material and Methods: We retrospectively assessed a cohort of 189 consecutive patients with stage III NSCLC having undergone radical (chemo-)radiotherapy using IMRT (until 2011) or VMAT (starting in 2011). Most patients (n=182) received 66 Gy in 33 (once-daily) fractions to the primary tumour and involved hilar/mediastinal lymph nodes based on FDG-PET/CT. Concurrent chemoradiation (CCR; n=122) consisted of 2 courses of etoposide cisplatinum, whereas sequential treatment (n=56) consisted of 3 courses of gemcitabine cisplatinum. Acute and late toxicity were assessed using the RTOG radiation morbidity scoring criteria for esophageal and pulmonary toxicity. Follow-up visits were planned every 3 months (first 2 years), biannually thereafter. Median overall survival (OS) was calculated using Kaplan-Meyer survival analysis. Differences between the groups receiving IMRT and VMAT were statistically tested using the Mann-Whitney-U or Chi-square test, where appropriate.

Results: Gender, age, performance score, clinical (tumour and nodal) stage and radiation dose did not significantly differ between the IMRT (n=93) and VMAT (n=96) groups. Patients undergoing IMRT, however, received less concurrent chemotherapy compared to patients treated with VMAT (n=51 vs n=71; p= 0.007). Incidences of grade ≥2 and ≥3 acute

esophageal toxicity (AET) were significantly lower for IMRT compared to VMAT (28 vs 57 patients, p<0.001; and 6 vs 17 patients, p=0.025, respectively). Maximum grade acute and late pulmonary toxicity did not differ between groups (p=0.57 and p=0.14, respectively). Grade ≥3 late esophageal toxicity was scored in 1 and 3 patients after IMRT and VMAT, respectively. Median follow-up for the patients alive was 32 months (range 2.4-82.1 months). Median OS was 23.9 months (95% CI 19.6-28.1), without a significant difference between the groups (23.9 and 24.9 months for IMRT and VMAT, respectively; p=0.70).

Conclusion: Patients treated with VMAT showed significantly higher incidence of Grade ≥2 and ≥3 AET, which may be due to a higher percentage of patients receiving CCR in the VMAT-group. Median OS did not differ between groups. Currently the target volumes and dosimetric data are evaluated for differences between the groups, for we hypothesized that VMAT enables treatment of larger tumour volumes, leading to increased AET.

PO-0680
Predictive models of the extent and CT appearance of radiation induced lung injury for NSCLC
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Purpose or Objective: The purpose of the present study was to investigate the extent and appearance of early radiologic injury in the lung after radiotherapy (RT) for non-small cell lung cancer (NSCLC). Furthermore, the ability of planned mean lung dose to predict the risk of a radiologic response was explored.

Material and Methods: Eligible follow-up computed tomography (CT) scans acquired within 6 months after commencement of radiotherapy were retrospectively evaluated for radiologic injuries in a cohort of 213 NSCLC patients treated to 60 or 66 Gy in 2 Gy fractions at a single institution from 2007 to 2013. Radiologic injuries were divided in two categories based on CT appearance. Category 1 represented ground-glass opacity (GGO) and interstitial changes. Both are characterized by moderately increased densities in the lung parenchyma, but where GGO appears diffuse, amorphous, and with poorly defined vessel structures, interstitial changes are identified by more pronounced vessels and borders. Category 2 indicated patchy or confluent consolidation in the lung. The volume fraction of injured lung corresponding to either category was estimated in each scan. To investigate the relationship between the volume fraction of injured lung and mean lung dose, a logistic regression analysis was performed. Four different cut-points were chosen to define radiologic injury response. These were volume fractions of injured lung larger than 5%, 10%, 15%, or 20%. Both individual and combined categories were investigated.

Results: Radiologic injuries of category 1 and 2 were found in follow-up scans for 81% and 42% of the patients, respectively. The mean volume fraction of injured lung was 6.5% (range 0-95%) and 1.7% (range 0-22%) for category 1 and 2, respectively, and 8.2% (range 0-95%) when the categories were combined. The logistic normal tissue complication probability (NTCP) models are shown in the figure for the combined categories of lung appearance. The risk of radiologic response was found to be significantly associated with mean lung dose. The mean lung dose resulting in 50% risk of radiologic response (D50) increased from 17 to 29 Gy as the cut-point used for dichotomization increased from 5 to 20% of volume fraction of affected lung (see table). A logistic relationship between radiologic response and mean lung dose was also found for the individual categories of lung