Conclusions: Sng and Sep plans were very similar from the dosimetric (D98, D95, D50, D02) and volumetric (V40) point of view. However, in terms of dose delivery (Time, MU), differences were remarkable. This may ecologically profitable and save patient times. These differences were unfluctuating, even if the ROV were changed broadly in the clinical situation.

EP-1229
Overall treatment time and toxicity of IMAT with integrated boost for intermediate or high-risk prostate cancer
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Purpose/Objective: To report toxicity considering overall treatment time of intensity Modulated Arc Therapy (IMAT) with simultaneous integrated boost (SIB) for patients with intermediate or high-risk prostate cancer.

Materials and Methods: One hundred forty two consecutive patients, diagnosed with intermediate or high risk prostate cancer, were treated definitively between September 2011 and May 2014. Androgen suppression was administered considering disease risk factors. The IMAT plans were designed to deliver 70.8 Gy in 30 fractions (2.36 Gy/fraction) while delivering simultaneously to the prostate plus margin 60 Gy (2Gy/fraction). Univariate and multivariate analysis with logistic regression were performed looking for relations among patient characteristics and toxicity. CTCAE v3.0 morbidity scores were used to assess acute and late toxicities. Outcome, measurements: toxicity and biochemical response were assessed prospectively.

Results: Median age of those patients was 72 years old (from 58 to 81). Pathologically centralized Gleason score was 7 for 81.7 % of patients. Mean PSA value was 9.6 ng/ml (from 2 to 36ng/ml). Forty one percent of patients were classified as T1-T2a, 37.5% as T2b-c and 21.5% as T3. Median IPPS was 5 (0 to15). The median follow-up period was 14.8 months. All patients received the prescribed dose in 30 fractions delivered between 36 to 57days. Median radiation overall treatment time (OTT) was 47 days. Seventy-five percent of patients received a course of hormone deprivation for 6 months at least. One biochemical relapse was observed in this cohort of patients. Five patients died during the follow-up period without cancer relapse or toxicity. Acute genito-urinary toxicity was observed in 81% of patients with maximal score of 2 in 40.9% of patients. Rectal acute toxicity grade 2 with mucosal discharge was present in 17.6%. Presence of any acute rectal toxicity risk is increased by 2.3 fold in the shorter OTT. Late rectal toxicity Grade 3 was seen in one patient and 5 more patients showed grade 2 score. Chronic urinary toxicity grades 1-2 were observed in 27.5% of patients, but only two patients with grade 2. Absence of acute toxicities decreased the risk for chronic rectal toxicity by 0.2 and urinary by 0.09. Neither, hormonal deprivation nor fiducial markers for IGRT showed any impact on toxicity.

Conclusions: IMAT with SIB to the prostate was well tolerated in this series, with acceptable rates of acute and early late toxicity. Shorter OTT seems to increase the risk of acute rectal toxicity whereas initial IPSS increased the risk of late urinary toxicity. The absence of both acute rectal and urinary toxicities decreased the risk of chronic toxicities. Additional follow-up is necessary to fully define the long-term toxicity.

EP-1230
The level of lymphopenia inversely correlates with the risk for late urinary toxicity after WPRT for prostate cancer
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Purpose/Objective: We initiated a correlative analysis of urinary toxicity (UT) and radiation-induced lymphopenia to test the hypothesis that patients (pts) experiencing more severe lymphopenia may be at higher risk for UT, owing to
suboptimal repair of RT-induced damages to local blood cells circulating in the pelvis during irradiation (RT) and reduced pelvic hematopoiesis.

**Materials and Methods:** In 2012 a prospective, observational, study evaluating hematologic and urinary toxicity after whole-pelvis radiotherapy (WPRT) was activated. For the study purposes, the International Prostate Symptoms Score questionnaire (IPSSq) has to be filled by pts and a blood sample has to be obtained at baseline, at RT mid-point and end, and after 3, 6, 12, 18, 24, 30 and 36 months. RT was delivered with static-field IMRT, Tomotherapy and VMAT in 17, 23 and 34 pts, respectively, at conventional fractionation (CF, 1.8-2 Gy) in 24 and with moderate hypofractionation (HYPO, median 2.35 Gy/fraction) in 50. WPRT was delivered at up to 50.4 Gy/28 fractions in CF and at 52.50 Gy/30 fractions in HYPO. The median variation (delta, Δ) of absolute lymphocyte count at given time over baseline (ΔALC) was calculated.

**Results:** For 74 pts both baseline and one year IPSSq were collected, for 69 blood samples were taken at baseline and RT mid-point and end, for 66, 67 and 71 pts also at 3, 6 and 12 months, respectively. The median ΔALC at RT mid-point and end, and at 3, 6 and 12 months after WPRT completion was 35%, 30%, 45%, 50% and 54%, respectively. A borderline association between ΔALCs and ΔIPSS at 12 months was found (Mann-Whitney test: p-values 0.056-0.09). Unexpectedly, by 1-year. months (OR 3.52, p=0.02) in predicting worsening of IPSS at 12 months, were entered into a multivariable Cox model which confirmed an independent role for

Conclusions: These results indicate that pts with reduced RT-induced lymphopenia are at higher risk for UT when compared to more lymphopenic patients. Given the notion that RT favours leukocyte extravasation (Vianello et al. Br J Hemat 2013), we postulate that late UT may be caused, at least in part, by tissue-infiltrating leukocytes able to propagate local inflammation and more pronounced fibrotic processes in the late regenerative phase, one of the possible main causes for the onset of late UT following RT. These data provide rationale for addressing changes of inflammatory markers during/after RT and support the use of ΔALC as predictive of UT.

**EP-1231**

Comparison of cone beam CT imaging protocols in image-guided radiotherapy for prostate cancer

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**Purpose/Objective:** To assess the effects of verification imaging protocol on the actual doses delivered to the target volume and organs at risk during a course of image-guided radiotherapy (IGRT) for prostate cancer.

**Materials and Methods:** 844 cone-beam CT (CBCT) verification images from 20 patients undergoing radical prostate radiotherapy were analysed. All patients received a dose of 74 Gy in 37 fractions using 7-field intensity-modulated radiotherapy (IMRT). During treatment, patients had daily online CBCT soft tissue match verification using the Elekta XVI system. Early toxicity was assessed using the RTOG acute radiation morbidity scale. All CBCT images were imported into the Pinnacle treatment planning system. Target volume and organs at risk were contoured manually on each CBCT image. A 7 mm margin in all directions was used around the clinical target volume (CTV) to obtain the planning target volume (PTV). Soft tissue match shifts were separately applied to each CBCT image. The CBCT contours were superimposed on the planning CT scan for dose-volume analysis. Dose-volume parameters were assessed for the PTV, CTV, rectum and bladder. The same contours were used for comparison of a daily online schedule with a protocol of day 1-3 followed by weekly imaging. A further comparison was carried out between online and offline weekly verification schedules. Paired t test and Wilcoxon signed rank test were used to compare parametric and non-parametric dosimetric statistics.

**Results:** 90% of patients had improvement in prostate target coverage with daily online imaging in comparison to weekly online imaging, with statistically significant benefits in dosimetric parameters assessed (Table 1). Daily online imaging was the best verification protocol, with a median of 37 fractions (out of 37) achieving CTV coverage with daily imaging compared with 33 and 34 fractions respectively with weekly offline and weekly online protocols (Fig. 1). There were low levels of acute toxicity in the patient population when daily imaging was used. On dosimetric analysis, 80% of patients had a reduction in rectal dose with the daily imaging protocol. On average, there was a 1.13 Gy reduction in mean rectal dose, which would mitigate the concomitant dose to