**Materials and Methods:** 345 patients with high-risk prostate cancer (T3 or Gleason score [GS] 8−10 or PSA > 20 ng/dl) were treated with curative radiation therapy + neoadjuvant and concomitant hormonal therapy; 303 also received adjuvant androgen suppression. According to timing of hormonal therapy the patients were stratified into two group: group 1 of 285 patients received <36 months of adjuvant hormonal therapy and group 2 of 60 patients received >36 months of adjuvant hormonal therapy. Hormonal therapy was based both on LH-RH agonist (+/− antiandrogens) or high dose antiandrogen alone (bicalutamide, 150 mg/day). Total dose to the prostate ranged from 70 Gy to 74 Gy (1.8 Gy/fraction). bDFS was calculated from the time of diagnosis with Kaplan-Meier method.
**Results:** Median follow-up was 44 months (12–161 months). Median age of patients was 71 years (range 41−83 years). Clinical and pathological characteristics of study population were: T2 10 (2.8%), T3 330 (95.7%), T4 5 (1.5%); PSA < 10 ng/ml 152 (44.7%), PSA 10−20 ng/ml 99 (29.1%), PSA >20 ng/ml 89 (26.2%); GS 2−6 152 (44.3%), GS 7 126 (36.7%), GS 8−10 65 (19.0%). The bDFS at 5 years was 78% and 91% in patients of groups 1 and 2, respectively (p = 0.028). Considering only the patients who finished adjuvant hormonal therapy the bDFS at 5 years was statistically significant too (p = 0.032).
**Conclusions:** Prolonged >36 months adjuvant hormonal therapy improves biochemical desease free survival in patients with high-risk prostate carcinoma.

**4040** POSTER

**Salvage 3-D conformal radiation therapy for patients developing biochemical failure post prostatectomy: a single institution experience**

B. Joshua[1], M. Duclos[1], S. Jeyaganth[2], S. Faria[1], G. Shenouda[1], M. David[1], F. Cury[1], L. Souhami[1]. *[1]Montreal General Hospital, radiation oncology, Montreal – Quebec, Canada; [2]Montreal General Hospital, urology, Montreal – Quebec, Canada*

**Background:** Two recent randomized trials have shown a benefit to the use of adjuvant external beam radiation therapy (RT) post radical prostatectomy (RP) in patients presenting with high-risk features. However, residual postoperative GU toxicity, as well as fear of RT complications lead to delays in referral to radiation therapy. We retrospectively reviewed the outcome of patients presenting with biochemical relapse post RP treated with RT as salvage therapy.
**Methods:** Between September 1998 and July 2004, 102 patients (median age: 65 years) received salvage RT post RP biochemical failure. All patients underwent pre-RT staging using bone scan and CT scan of the abdomen and pelvis. RT typically delivered a dose of 66 Gy in 33# using 18 MV photons. A total of 25 patients received hormones given in a neoadjuvant and concomitant setting. Acute and late toxicities were graded using the CTC v3 criteria. We prospectively assessed their quality of life using the IPSS (international prostate symptom score) and SHIM (sexual health inventory for men).
**Results:** The median time for RT referral post RP is 24months. The median follow up time is 37 months (6–122). 44% of our patients presented with pT3 disease, 53% with positive margins and 28% with >7 Gleason score. Among them, 37% never achieved an undetectable post RP PSA level. The median pre-RT PSA is 1.00 ng/ml (range:0. 01−10.4).
Biochemical failure was defined according to SWOG criteria as any PSA > 0.5 ng/ml at least 6 months after RT. 79 patients (77%) were followed for at least one year.
28 patients (27%) developed biochemical relapse after salvage radiation, at a median time of 21 months. Of these, 22% of patients who had a pre-RT PSA < 1 ng/ml had biochemical relapse as compared to 38% with pre-RT PSA > 1 ng/ml.
Prior to RT, 41% of the patients had some degree of stress incontinence. None of our patients developed RT-induced stress incontinence. Acute and late GI/GU toxicities were minimal, 1 patient developed grade 3 urethral stenosis, one had G3 late GI and GU Toxicity.
**Conclusion:** Our results are comparable to others published in the literature. Post op RT was well tolerated with minimal GI and GU toxicities. As previously reported, a pre-RT PSA > 1 ng/ml was associated with higher biochemical relapse.

**4041** POSTER

**$^{18}$F-choline and/or $^{11}$C-acetate positron emission tomography: detection of residual or progressive subclinical disease at very low PSA values (<1 ng/ml) after radical prostatectomy**

H. Vees[1], F. Buchegger[2], S. Albrecht[2], H. Khan[3], D. Husarik[4], H. Zaidi[2], D. Soloviev[2], T.F. Hany[4], R. Miralbell[1]. *[1]University Hospital, Radiation Oncology, Geneva 14, Switzerland; [2]University Hospital, Nuclear Medicine, Geneva 14, Switzerland; [3]Institute of Radiology Jean Violette, Radiology, Geneva 14, Switzerland; [4]University Hospital, Nuclear Medicine, Zürich, Switzerland*

**Background:** To assess the value of PET/CT with either $^{18}$F-choline and/or $^{11}$C-acetate of residual or recurrent tumor after radical prostatectomy (RP) at a PSA < 1 ng/ml and referred for adjuvant or salvage radiotherapy.
**Materials and Methods:** 22 PET/CT studies were performed, 11 with $^{18}$F-choline (group A) and 11 with $^{11}$C-acetate (group B), in 20 consecutive patients (2 patients undergoing PET/CT scans with both tracers). Median PSA before PET/CT was 0.33 ng/ml (range 0.08−0.76). Endorectal MRI was performed in 18 patients. Nineteen patients were eligible for evaluation of biochemical response after salvage RT.
**Results:** Abnormal local tracer uptake was observed in 5/11 and 6/11 patients in group A and group B, respectively. Except for a single positive obturator lymph node, no other site of metastasis was observed. In the 2 patients evaluated with both tracers no pathologic uptake was observed. Endorectal MRI was locally positive in 15/18 patients. 12/19 patients responded with marked PSA decrease (>50% of baseline) 6 months after salvage RT.
**Conclusions:** Although $^{18}$F-choline and $^{11}$C-acetate PET/CT studies succeeded to detect local residual or recurrent disease in about half of the patients with PSA-values <1 ng/ml after RP, these studies can not yet be recommended as a standard diagnostic tool for early relapse or suspicion of subclinical minimally persistent disease after surgery. An endorectal MRI may be more helpful especially in patients with a low likelihood for distant metastases. Nevertheless, further research with $^{18}$F-choline and/or $^{11}$C-acetate PET with optimal spatial resolution may be needed for patients with a high risk of distant relapse after RP even at low-PSA values.

**4042** POSTER

**Rectal volume changes during treatment: the case for ansisotropic safety margins around the clinical tumor volume in radiotherapy for prostate cancer**

D. Linero[3], G. Dipascuale[1], J. Lozano[2], C. Ares[1], P. Nouet[1], L. Escude[3], M. Molla[2], M. Rouzaud[1], R. Miralbell[1]. *[1]Hôpitaux Universitaires de Geneve CH, Radiation Oncology, Geneve, Switzerland; [2]Instituto Oncologico Teknon, Radiation Oncology, Barcelona, Spain; [3]Instituto Oncologico Teknon, Medical Physics, Barcelona, Spain*

**Background:** To evaluate the influence of rectal volume changes (on sequential weekly CTs) on the antero-posterior (A-P) axis motion of the clinical target volume (CTV=prostate+seminal vesicles) at its apex, mid-point, and top in order to estimate for potentially anisotropic planning target volume (PTV) margins in patients undergoing 3-D conformal radiotherapy for prostate cancer.
**Material and Methods:** Eighty-nine patients were selected for this study. A planning CT was performed at simulation in a supine position with an empty bladder in 77 patients while 12 patients underwent, in addition, a rectal enema before simulation and before every treatment session. Weekly control CTs were implemented to all patients while on treatment (i.e., 4−7 weekly CTs per patient). The CTV and the rectum were contoured in every CT by two experienced authors (one in Geneva and one in Barcelona). Bone registrations between the simulation CT and weekly control CTs for every patient in the study was performed in order to assess for CTV A-P displacements (at the apex, mid-point, and the top) and rectal volume changes. Ideal A-P margins for the PTV were estimated at the three CTV levels.
**Results:** The estimated PTV A-P margins (a the CTV apex, mid-point, and top) for the 77 patients not undergoing the rectal purge, were 10, 10 and 12 mm; 12, 11, and 14 mm; and 12, 13 and 22 mm for patients with small (<60 cc), medium (60–110 cc), or large (>110 cc) rectal volumes on simulation CTs, respectively. For the 12 purged patients the estimated PTV margins were 9, 10, and 7 mm (mean rectal volume at simulation, 55 cc). A broad rectal volume distribution was observed for unpurged patients, though, a significant trend for a volume decrease was observed after the 3rd week of treatment for these patients (p = 0.017).
**Conclusions:** In patients with small rectal volumes at simulation, as well as in those undergoing rectal enemas as part of their preparation to simulation and treatment, PTV margins were stable and relatively small (1 cm). Contrarywise, in patients with large rectum volumes at simulation,