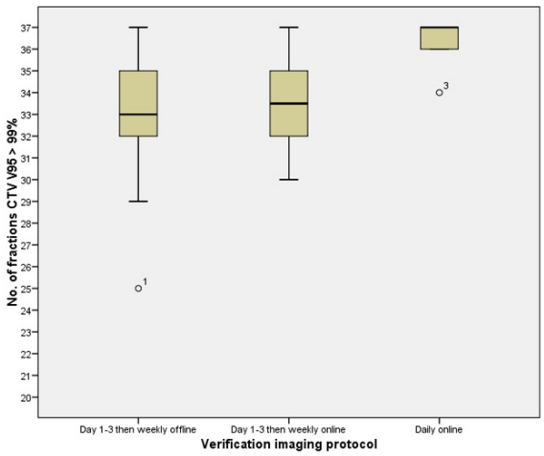
pelvis from imaging. There were no significant differences in bladder dose. The magnitude of benefit of daily imaging for a patient could not be predicted by characteristics on planning CT scan.

Table 1. Dosimetric parameters – daily online vs weekly online verification (n=20)

Parameter	Daily Online	Weekly Online	Difference: Daily - Weekly	SEM	p
PTV V95 / %	92.88	89.91	2.97	0.50	p < 0.001
CTV V95 / %	99.94	99.48	0.47	0.11	p < 0.001
CTV V98 / %	97.92	96.91	1.01	0.20	p < 0.001
Rectal V50Gy / %	32.48	34.96	2.49	0.99	p < 0.05
Mean rectal dose / Gy	36.56	37.68	1.13	0.52	p < 0.05
Bladder V65Gy / %	10.32	9.90	-0.42	0.30	NS
Mean bladder dose / Gy	23.13	22.82	-0.31	0.28	NS

PTV – Planned target volume, CTV – Clinical target volume, SEM – Standard error of mean, NS – Not significant

Fig. 1. CTV coverage - Comparison of verification imaging protocols



Conclusions: Daily online CBCT verification imaging improves CTV coverage and reduces dose to rectum during IGRT for prostate cancer.

EP-1232

Will extreme hypofractionation always improve outcome in prostate radiotherapy?

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Purpose/Objective: This study aimed to investigate the impact of increasing radiation delivery time on the outcome of hypofractionated radiation therapy for prostate cancer. Intrafraction repair is seldom discussed in relation to external beam radiation therapy as most fractional doses are delivered in the course of a few minutes and the beam-on time is not very much different from the time to deliver all individual fields. Advanced techniques aimed at delivering high fractional dose, employing multiple fields, scanning the target volume or requiring multiple imaging sessions may however take considerably longer, increasing the importance of intrafraction repair.
Materials and Methods: Mono-exponential and bi-exponential repair models have been used in prostate patients to study the loss of biologically effective dose for several clinically-relevant irradiation times between 5 and 60 minutes. These were then converted into loss of biochemical control at 5 years using clinically-relevant dose response curves derived from 10688 prostate patients treated with conventional fractionation. The theoretical predictions were subsequently compared with clinical results from 14 newly reported studies totalling 4363 patients undergoing conventionally-fractionated and hypofractionated prostate radiotherapy.
Results: For low-risk patients the equivalent doses delivered were quite high and consequently the reported results were very good and in agreement with theoretical predictions. For intermediate- and high-risk patients however, the results from hypofractionated schedules delivered with time-consuming techniques appear to be compatible with predictions accounting for intrafraction repair taking place during longer irradiations, while results from moderately hypofractionated or conventionally-fractionated schedules are in agreement with short irradiation times. Treatment sessions lasting more than about 20 minutes could lead to significant loss of biochemical control even when relatively slow repair is relevant for prostate tumours. Large effect losses could therefore be expected from extremely hypofractionated schedules with long irradiation sessions as might be the case of scanned beams and/or with multiple intrafraction imaging sessions to check the positioning of the patient. The loss of effect might also be reflected into an apparent reduced sensitivity to fractionation for the tumours.
Conclusions: Intrafraction repair plays an important role for prostate radiation therapy and may lead to loss of biological effect in the case of extremely hypofractionated techniques requiring increased irradiation times Neglecting intrafraction could also interfere with the derivation of the fractionation sensitivity for prostate tumours.

EP-1233

Model-based prediction of rectal toxicity reduction in prostate cancer IMRT with hydrogel rectum spacer

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Purpose/Objective: To test the hypothesis that implantation of a hydrogel rectum spacer in patients with prostate cancer undergoing intensity modulated radiation therapy (IMRT) reduces predicted probabilities for grade 2-3 (Gr2-3) acute and late rectal toxicities.
Materials and Methods: In 26 patients with localized prostate cancer (low-risk:8/26(31%); intermediate-risk: 11/26 (42%); high-risk: 7/26 (27%)), a hydrogel spacer (SpaceOAR®, Augmenix) was injected under transrectal ultrasound guidance in Denonvilliers' space between the prostate and the rectal wall. IMRT treatment plans (78 Gy in 39 fractions) were designed based on CT scans acquired before (IMRT-pre) and after (IMRT-post) hydrogel injection. Published nomograms based on clinical risk factors (use of anticoagulantia, hormonal therapy, and anti-hypertensives, presence of diabetes, haemorrhoids, pre-EBRT abdominal surgery) and dose-volume histogram (DVH) parameters (V_{40Gy}, V_{75Gy}) were used to estimate predicted probabilities for Gr2-3 acute gastro-intestinal (GI) toxicity[1], Gr2-3 late rectal bleeding (LRB)[2], and Gr2-3 fecal incontinence (FI)[2] for IMRT-