Men are advised to drink and practice holding as much water as possible to measure the effect of changing the drinking instructions, so we can differentiate between groups, so there may be implications for dose planning. We have proposed a follow-on project to fill in PCa IGRT, provided the Sim volume is not excessive. Volumes at Sim are statistically significantly larger (p < 0.01) than men refusing (83 mL). The Compliant men had bladder volumes (162 mL) statistically reduced. The extreme cases exerted strong leverage. In 38 well in excess of 500mL, and by mid-course, had greatly reduced. The extreme cases exerted strong leverage. In 38 well in excess of 500mL, and by mid-course, had greatly reduced. The extreme cases exerted strong leverage. In 38 well in excess of 500mL, and by mid-course, had greatly reduced.

Conclusion: Systematic and random changes in bladder volume during PCa IGRT are relatively insensitive to bladder filling in PCa IGRT, provided the Sim volume is not excessive (> 500mL). Volumes at Sim are statistically significantly different between groups, so there may be implications for dose planning. We have proposed a follow-on project to measure the effect of changing the drinking instructions, so men are advised to drink and practice holding as much water as possible to measure the effect of changing the drinking instructions, so they can comfortably tolerate without voiding for 1 hour.

EP-2094 Can Radiation Oncologist delegate to Therapist the kV setup control in patients with pelvic cancers? V. Frascino1, M. Ferro2, A. Alitto2, A. Castelluccia2, A. Petrone1, G. Nicolini3, S. Teodoli4, G. Mattucci5, G. Mantini6, M. Gambacorta1, S. Chiesa1, F. Deodato2, L. Azario1, S. Luzi1, V. Valentin1, M. Balducci3, 1Università Cattolica del Sacro Cuore - Policlinico A. Gemelli, Radiation Oncology Department- Gemelli-ART, Rome, Italy 2Università Cattolica del S. Cuore - Fondazione di Ricerca e Cura “Giovanni Paolo II”, Radiation Oncology Department, Campobasso, Italy

Purpose or Objective: Check of patients’ set-up is mandatory in modern radiation therapy. The aim of this preliminary analysis is to investigate the possibility to delegate to Radiation Therapists (RT) the evaluation of two-dimensional orthogonal kV/kV imaging of pelvic cancers.

Material and Methods: Paired orthogonal kV images of patients who underwent pelvic irradiation were independently evaluated by a trained RT (on-line control) and a Radiation Oncologist (RO, off-line control). If a displacement of the isocenter larger than 5 mm was observed, the RT had to call the RO to verify and confirm such displacement. The difference of measures and the agreement between RT and RT decisions were calculated. Results are presented as mean values, and population systematic (Σ) and random (σ) errors. SPSS software was used for the statistical analysis.

Results: From March 2015 to September 2015, 904 images’ pairs were obtained from 40 patients (10 prostate, 15 rectal, and 15 gynaecological cancers). A difference 3 mm was recorded in 766/904 (85%) paired images. A difference between 3 and 5 mm was recorded in 94/904 (10%) paired images. Forty-two/904 (4%) checks required on-line evaluation by the RO. In anteroposterior (AP), craniocaudal (CC) and mediolateral (ML) directions, systematic errors were 0.7, 0.4 and 0.8 mm, and random error were 0.2, 0.1 and 0.1 mm, respectively. Mean radial displacement was 2.6 mm (range 0-16 mm). CTV to PTV margins calculated by van Herk’s formula were 3.3, 2.3 and 3.0 mm (AP, CC and ML directions, respectively).

Conclusion: These data suggest that inter-observer variability between RT and RO is within few mm, therefore on-line kV/kV images’ evaluation could be delegated to RT after an adequate training period. Such kind of quantitative analysis can be used to define a proper action level to call for RO intervention. Similar study is currently ongoing to assess inter-observer variability for CBCT evaluation.

EP-2095 A retrospective evaluation of the feasibility of automatic prostate matching in IGRT Z. Campenelli1, B. O’Neill2, L. O’Sullivan3, M. Keaveney2, L. Mullaney1, 1Discipline of Radiation Therapy- School of Medicine- Trinity Centre Dublin, Radiation Therapy, Dublin, Ireland Republic of Ireland 2St Luke's Radiation Oncology Network- Beaumont Hospital, Radiation Therapy Department, Dublin, Ireland Republic of Ireland

Purpose or Objective: The current practice for prostate localisation in some centres is an automatic match to the bony anatomy of the pelvis. The prostate moves independently of bone and so its true motion may not be accounted for with this method. An automatic match to the prostate may be more accurate. The purpose of this research is to identify if automatic prostate matching is more accurate than automatic bony matching and assess the impact on CTV-PTV planning margins.

Material and Methods: A retrospective review of CBCT data for 30 consented prostate patients was undertaken (9 CBCT each, n=270). All patients followed a bladder filling and rectal emptying protocol. Using Varian’s On-Board Imaging software, the random; systematic and population mean translational shifts was calculated based on 3 different registration techniques: automatic bone matching; automatic bone matching followed by an automatic volume of interest (VOI) match using CTV and an expert manual CTV match (gold standard). A comparison was made of the CTV-PTV margins required for the two automatic registration methods.

Results: No significant difference in the mean translational shifts was reported between the automatic bone match and gold standard match. A significant difference was seen between the population mean shift of the gold standard match and the automatic prostate match in the anteroposterior direction only (p=0.007). A larger CTV-PTV margin was required for the automatic prostate match when compared with the automatic bone match.

Conclusion: Automatic bone matching is comparable to expert manual matching in this patient group. Automatic prostate matching is not as accurate in the anteroposterior direction and does not allow for a reduction in planning margins.

EP-2096 Risk of rectal bleeding in patients with prostate cancer treated with RT on anticoagulant therapy B. Shima1, M.T. Martinetti1, M. Carnevale1, D. Musio1, R. Lisi1, V. Tombolini1, 1Policlinico Umberto I- “Sapienza” Università di Roma, Dipartimento di Scienze Radiologiche Oncologiche e Anatomo-Patologiche, Roma, Italy

Purpose or Objective: The aim of the study is to evaluate the risk of late rectal bleeding and its association with anticoagulants and/or antiaggregants use in patients receiving radiation therapy for prostate cancer.

Material and Methods: We analyzed 187 patients, age between 50-84, with prostate cancer who were managed from 2009 to 2011 at our institution. They were treated with curative intent intensity-modulated radiation therapy (IMRT 76 Gy/38 fractions) at the level of the prostate and seminal vesicles. The doses delivered to the rectum was evaluated in a manner consistent with ICRU 50-62-83. Dose constraint...
evaluation was performed according to RTOG recommendation for IMRT. Patients were placed in two main categories: no anticoagulants and/or antiangiagretes use category during RT and anticoagulants and/or antiangiagretes one. Rectal toxicity was evaluated using the Common Toxicity Criteria Adverse Effect (CTCAE v. 4.03) All patients had assumed the anticoagulant and/or antiangiagretes therapy before radiation therapy, during treatment as well as during the follow up.

Results: 20 of the 73 patients treated with anticoagulant and/or antiangiagretes therapy, presented rectal bleeding; while in the group of patients not taking anticoagulants and/or antiangiagretes this even occurred in 10 patients of 114 (p<0.001). Of the 20 patients who have received anticoagulant and/or antiangiagretes agent who presented rectal bleeding, 8 developed G1 toxicity, 10 had G2 toxicity and 2 patients had G3 toxicity. Of the 10 patients who did not receive anticoagulant and antiangiagretes therapy and presented rectal bleeding, 5 patients had G1 toxicity, 4 present G2 toxicity and G3 toxicity only 1 patient.

Conclusion: The results of our study found that patients taking anticoagulant and/or antiangiagretes therapy undergoing curative radiotherapy for prostate adenocarcinoma have a higher risk of developing rectal bleeding.

EP-2097
Patient friendly compression-belt settings in liver stereotactic radiotherapy
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Purpose or Objective: Stereotactic radiotherapy of liver metastases is challenging: breathing motion, and the flexibility of the abdominal organs, in particular remaining liver, may be large. This may render a priori imaging for position verification virtually useless. Hence, "decision to treat" may be difficult and stressful.

Abdominal compression may be used to reduce movement and flexibility, but maximum compression is highly uncomfortable and probably intolerable for patients during the entire session (20-30 min). Our institution has chosen to limit compression so that patients can endure it easily during the entire session. This study investigates whether this type of abdominal compression is effective.

Material and Methods: In short, a diagnostic 2 phase CT scan was used to locate tumor positions. Belt pressure and marking position (Orfit Industries), were reproduced for each patient. Each fraction, cone beam CTs (CBCT) were recorded before and immediately afterwards. Scans were matched offline, using deformable image registration (Varian Smart Adapt V13), resulting in "CBCT liver contours". These were checked and adjusted, if necessary.

Each CBCT liver contour was compared to original CT contour using absolute volume, center of mass shift (CMS) and dice coefficient (DC). To assess effectiveness of compression, data were averaged for each of the three computed parameters.

Results: Until this date, a total of 6 patients were treated using this technique. All 6 tolerated the applied abdominal compression easily during the sessions. Therapists, trained in >> 100 brain or lung stereotactic treatments, reported no exceptional difficulties in fixation, CBCT, and matching. Data from 4 patients, and a total of 24 CBCTs, were eligible for analyses. Liver CT volumes appeared to be very similar to CT contours: the average is only 18 cc less, with a maximum of 116 cc. The average CMS in X, Y, Z are 0.14cm (max 0.41cm), 0.05cm (max 0.33cm) and 0cm (max 0.23cm), respectively. Average DC is 0.94, with a range of [0.89 0.99].

Conclusion: Difference in volume, center of mass, and even shape are well within the range of standard uncertainties in stereotactic abdominal radiotherapy. This corroborates with the reported feasibility by therapists treating these patients. In short, the patient comfortable setting of the compression-belt is reproducible and safe to correctly deliver the dose in stereotactic radiotherapy of the liver.

EP-2098
Use of a bladder minimum contour for prostate treatment planning to increase comfort and efficiency
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Purpose or Objective: Prostate cancer patients often find it difficult to maintain a full bladder throughout the course of their radiotherapy treatment. These bladder filling problems can result in patients being taken out of the treatment room in order to increase bladder filling, leading to treatment delays. The aim of this study was to provide a range of acceptable bladder sizes without compromising the bladder dose constraints.

Material and Methods: An audit was carried out with ten patients who attended for IMRT radiotherapy planning for prostate cancer. A minimum bladder volume (bladder min) in each patient was defined by cropping the planning CT (pCT) bladder volume to around 150cc. This new volume was then used in addition to the pCT bladder volume in the IMRT plan optimisation to fulfil the bladder dose constraints. The patients had their bladder volume assessed prior to treatment using a standard CBCT imaging protocol. Retrospective dose calculations were undertaken using the daily CBCT images, and bladder doses were plotted against bladder volume to demonstrate that dose constraints were still being met at the reduced bladder volume. The tolerance doses used are taken from the CHTHP trial protocol.

Results: The bladder min contour is used by the treatment radiographers as a visual guide on the CBCT scan taken before each treatment in order to assess whether the patient's bladder is an acceptable size to continue with treatment without compromising bladder tolerance doses. The volume of the bladder min contour is adjusted to meet the constraints for each individual patient as necessary.

The need for patients to be taken out of the treatment room to re-fill the bladder has been reduced and this has resulted in better workflow on the treatment floor. The use of the bladder min contour for prostate IMRT treatment planning is now standard practice in our clinic.

Conclusion: The use of the bladder min contour has improved patient comfort without compromising the therapeutic ratio and has aided the radiographers in online review of treatment images.

The implementation of the above has led to a reduction in treatment delays due to the bladder volume obtained at planning CT not being maintained throughout treatment. This has improved the clinic workflow. Patient discomfort is kept to a minimum and repeat CBCT scans have been reduced.

EP-2099
Influence of anxiety on reproducibility of cancer patients (pts) repositioning during pelvic RT
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Purpose or Objective: The aim of the study was an analysis of an influence of type and intensity of pts anxiety on pts repositioning during planning and delivery of RT to the pelvic area in relation to pts gender, immobilization device, and