Results: Thirty-four patients were treated in the selected time period, 15 male and 19 female, and 13 right limbs and 21 left limbs. Radiotherapy was delivered pre-operatively in 18 cases and post-operatively in 16 cases. In 20 cases, localisation was performed to the pelvis, 12 cases to the knee joint and 2 cases to the shaft of the femur. The mean population error in the vertical, longitudinal, and lateral directions was 0.3mm, 0.2mm and -0.3 mm respectively. Systematic and random errors for these directions were calculated to be 1.6(2.4) mm, 1.4(2.2) mm and 1.0(2.5) mm respectively. These data resulted in calculated margins in the vertical, longitudinal and lateral directions of 5.6mm, 5.1mm and 4.3mm respectively.

Conclusions: These data show that our customised immobilisation system and imaging protocol provide a set-up reproducibility covered by the margins typically used (5-7mm). Although margin reduction could be facilitated, there are limitations of this audit. Firstly, the limitations of the kV imaging length results in only one end of the limb being imaged and therefore the effect of rotation cannot be seen at the other end. Secondly, since direct visualisation of the soft tissue target is not possible with kV imaging, planning target volume (PTV) coverage is only assumed. The advent of extended length cone beam CT will enable direct visualisation of PTV, the entire extent of the femur, and other organs at risk e.g. external genitalia.

EP-1665
Do radiotherapy tattoos reliably guide patient set up for breast tumour bed treatment? - A review of current practice
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Purpose/Objective: The introduction of a national trial where the whole breast, partial breast and tumour bed are concurrently treated using photon radiotherapy and verified using daily online Cone Beam CT (CBCT) imaging, has enabled this institution to gather 3D set up data in regards to breast tumour bed coverage. The tumour bed Clinical Target Volume (CTV) is expanded by 0.5cm in 3-dimensions to create the tumour bed Planning Target Volume (PTV). Treatment will only be delivered when the tumour bed is within 0.2cm of the planned position.

Breast patients were immobilised with both arms above head using the Q-Qual™ board. During patient set up, alignment of the lateral and anterior radiotherapy tattoos was achieved. All planned isocentric shifts were executed to determine the L-R, S-I and the initial A-P treatment position. A further A-P adjustment may be required dependant on the planned concurrent tangential beam entry point in relation to the radiotherapy tattoos. This review aims to evaluate the reliability of using radiotherapy tattoos for breast patient set up in relation to breast tumour bed coverage for trial patients at this institution.

Materials and Methods: Imaging data for trial breast patients receiving 3-D-CBCT guided radiotherapy, treated between January 2014 and October 2014, was retrospectively analysed within Elekta Synergy ™-version 4.5.

The frequency of set-up corrective action greater than 0.2cm in response to 3D-CBCT imaging and associated treatment margins were determined.

Results: Data for 135 treatment sessions of 9 patients was analysed. 85% of sessions required set-up correction greater than 0.2cm in at least one direction; 56% (76/135) of moves were required in the L-R direction, 46% (62/135) in the S-I direction and 54% (73/135) in the A-P direction (with an average magnitude shift of 0.32cm, 0.31cm and 0.34cm respectively).

The required CTV-PTV margin for the tumour bed, based on uncorrected and corrected data, is shown in table 1.

Conclusions: Treatment accuracy within 0.2cm in any translational plane will only be achieved in 15% of trial breast tumour bed treatments where set up is guided using radiotherapy tattoos alone. However, using radiotherapy tattoos in conjunction with 3D-CBCT image guidance will ensure accurate tumour bed coverage using the current 0.5cm CTV-PTV expansion of the breast tumour bed. The local practice of ensuring tumour bed coverage is within 0.2cm in any given translational plane prior to treatment delivery does imply that a CTV-PTV margin of less than 0.5cm could be applied for this trial. However, margin reduction should be applied with caution, as delineation and intra-fractional variation has not been measured.

EP-1666
Validation of a method for selecting patients for daily image and online evaluation in head and neck cancer treatments
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Purpose/Objective: Our center is using NAL3 plus weekly imaging as Image Guidance protocols for 3DCRT and IMRT techniques. However some of head and neck cancer (HNC) patients ended up with daily images. Our goal is to propose a method to identify HNC patients that should be included in a daily image on-line review protocol after the three first fractions.

Materials and Methods: HNC patients are immobilized by customized thermoplastic masks. Patients are first positioned by matching lasers to three marks on the mask. Then, kV-MV orthogonal images are taken and compared on-line with DRRs