a second operation. TIC, in our experience, is a simple, cost-effective and rapid intra-operative assessment tool to allow a single stage approach to axillary node status. We are now routinely acting on the basis of the TIC result.

**5124** POSTER

**Left anterior descending coronary artery (LAD) doses from breast radiotherapy: is prone treatment positioning beneficial?**

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**Introduction:** Breast radiotherapy increases risks of late cardiovascular mortality/morbidity. LAD irradiation is implicated in pathogenesis but the effects of prone positioning on its dosimetry are unknown. We compare LAD and heart doses from whole (WBI) and partial (PBI) breast radiotherapy planned prone and supine.
**Methods & materials:** Twenty-two patients with left breast cancer had titanium clips placed in excision cavity walls at breast conservation surgery. Each underwent standard supine CT-scanning before being repositioned & re-imaged prone on an in-house platform with an aperture through which index breast falls. Partial-breast CTV was defined as tumour bed (clips/tissue distortion) +15 mm margin. WB clinical target volume (CTV) was defined using radio-opaque wire marking clinically palpable breast tissue. Heart & LAD were outlined. Tangential-field PBI & WBI plans were generated for each position (total: 88 plans). Mean normal tissue doses ($NTD_{mean}$) for heart/LAD, & maximum LAD ($LAD_{max}$) doses were compared for prone vs supine positions (paired t-test) and by individual patient (IP).
**Results:** Population data are summarized in the table.

| | Mean doses (standard deviation) | | | | | |
|---|---|---|---|---|---|---|
| | WBI | | | PBI | | |
| | Supine | Prone | p | Supine | Prone | p |
| Heart $NTD_{mean}$ ($Gy_3$) | 1.1 (0.4) | 1.0 (0.6) | 0.9 | 0.3 (0.2) | 0.5 (0.3) | 0.05 |
| LAD $NTD_{mean}$ ($Gy_3$) | 11.1 (7.2) | 10.0 (6.7) | 0.7 | 2.0 (1.6) | 3.5 (2.9) | 0.05 |
| $LAD_{max}$ (Gy) | 48.1 (4.6) | 46.1 (4.4) | 0.1 | 27.0 (18.0) | 32.3 (17.3) | 0.4 |

Reviewing IP data for WBI, prone positioning improved heart/LAD doses in 13/22 cases (mean improvement in LAD $NTD_{mean}$ = 8.1 Gy) but worsened doses in 9/22 cases (mean increase in LAD $NTD_{mean}$ = 9.8 Gy). A supine LAD $NTD_{mean}$ of $\geqslant$12 Gy correlated with a benefit from prone treatment on LAD $NTD_{mean}$ ($p < 0.001$) & $LAD_{max}$ ($p = 0.02$). In the context of PBI, prone positioning improved cardiac doses in only 6/22 cases (mean $LAD_{max}$ improvement = 19.0 Gy) but worsened doses in 16/22 cases (mean $LAD_{max}$ increase = 19.7 Gy). For both WBI & PBI, breast volume >1000 $cm^3$ correlated with a benefit from prone treatment ($p = 0.003$).
**Conclusions:** Mean LAD doses from both prone & supine tangential-field WBI are significant. Prone positioning is likely to improve LAD dosimetry only in women with breast volumes >1000 $cm^3$ ($\geqslant$D cup (UK)) and/or supine LAD $NTD_{mean}$ doses of $\geqslant$12 Gy, and should be used with caution in smaller-breasted women in whom the position is likely to be detrimental. LAD doses from PBI are overall lower than from WBI but prone positioning is again likely to be detrimental in women with breast volumes $\leqslant$1000 $cm^3$.

**5125** POSTER

**Verifying CTV-PTV margins for isocentric breast cancer radiotherapy, using an off-line correction protocol and fixed couch height**

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**Background:** To investigate patient setup (SU) variability, and thus PTV margins, when implementing a new, fully conformal, isocentric irradiation technique with standardised immobilisation material and fixed couch height (FCH).
**Materials and Methods:** From 03/02/09 to 23/03/09, 530 portal images (PI's) were analysed from 65 consecutive patients, 44 with tangential (TG) fields and 21 with TG fields plus nodal irradiation (TG + N). Patients were simulated on a conventional simulator to mark the isocenter. Patients were immobilised using a breastboard. A CT scan was taken in the same position. For all patients treated with TG + N fields, 2 SU fields and all treatment fields were checked on the simulator before start, verifying patient positioning, couch parameters, position of the leafs, source-skin distances, correct shielding of contralateral breast, chin and larynx and verifying the correspondence with the Digitally Reconstructed Radiographs. During treatment, patients were positioned according to fuchsine lines, but with FCH determined on the simulator and a tolerance of 5 mm in lateral (Lat) and cranial-caudal (CC) direction. PI's of all treatment fields were taken on day 1 and halfway. For patients treated with TG + N fields, PI's of 2 SU fields were taken on day 1, 2 and 3 (D1−3) of the course and further on weekly. D1−3: online adjustment if mismatch >5 mm. Mean mismatch (MM) was calculated after 3 days, using values of PI's taken before any online correction. When MM was larger than 3 mm, adjustments were applied for the rest of the course.
**Results:** Systematic SU errors were 1.9 mm in anterior-posterior (AP), 2.0 mm in Lat and 2.3 mm in CC direction. Mean of systematic errors was 0. Random SU errors were 1.3 mm in AP, 1.6 mm in Lat and 1.3 mm in CC direction. Per patient and in every direction, MM of D1−3 very well predicted the eventual systematic error over the whole course, indicating the usefulness of the correction protocol. Using the formula of Van Herk et al., margins should be 6 mm in AP and Lat and 7 mm in CC direction.
**Conclusions:** Analysing match results, our centre specific SU accuracy for breast cancer treatment is comparable but slightly better then expected compared to literature and former own work. In our opinion, this is due to strict patient positioning with FCH and a tolerance of 5 mm in lateral (Lat) and cranial-caudal (CC) direction and to the use of a correction protocol. Calculated CTV-PTV margins were introduced in our centre, allowing a better sparing of the organs at risk.

**5126** POSTER

**Ipsilateral breast tumour relapse: local recurrence versus new primary and the effect of whole breast radiotherapy on the rate of new primaries**

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**Background:** The justification for partial breast radiotherapy (PBRT) after breast conservation surgery for early breast cancer includes an assumption that ipsilateral breast tumour relapses (IBTR) presenting outside the index quadrant are mostly new primary tumours (NP) that develop whether or not radiotherapy is given. We aim to test the hypothesis that whole breast radiotherapy (WBRT) is ineffective in preventing NP by comparing rates in irradiated and contralateral breasts after tumour excision and WBRT.
**Materials and Methods:** A retrospective review was undertaken of 1410 women with breast cancer entered into a prospective randomized trial of radiotherapy fractionation involving annual clinical assessment to identify IBTR and contralateral breast cancer (CLBC). IBTR was classified into local recurrence (LR) or NP based on location and histology, and subdivided as definite or likely depending on the completeness of clinical data. Rates of ipsilateral NP and CLBC were compared over a 15-year period of follow-up. Due to the non-independence of the endpoints, complex statistical methods are required for formal comparison of event rates.
**Results:** At a median follow-up of 10 years, there were 150 documented cases of IBTR: 118 (79%) were definite or likely LR; 27 (18%) were definite or likely NP; and 5 (3%) could not be classified. There were 71 cases of CLBC. Results of an analysis which allows for the reporting of multiple events within an individual will be reported to formally compare event rates.
**Conclusions:** Despite uncertainty in some cases in classifying IBTR as LR or NP on clinical criteria, the absolute numbers of each event type appear to suggest that WBRT reduces the rate of ipsilateral NP tumours.

**5127** POSTER

**Hypofractionation versus conventional fractionation radiotherapy (RT) after breast conservative treatment of breast cancer: radiation induced pneumonitis**

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**Background:** Hypofractionated RT for breast cancer has beneficial aspect on patients and health care systems due to reduction of treatment time and cost, but the incidence of potencial adverse effects on underlying normal lung tissue should be further investigated.