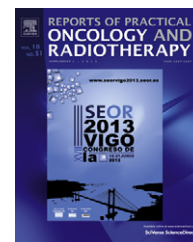


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## Technology and applied physics

### Descriptive statistics of unscheduled interruptions in prioritised radiotherapy treatments

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**Objective.** To record and present statistics, causes and management of unscheduled treatment interruptions of two prioritised fast-growing tumours in our centre: head and neck squamous cell carcinoma and non-small cell carcinoma of lung.

**Methods.** All of these patients that completed their treatment course in 2011 and 2012 in the same linac have been recorded using Elekta Mosaic<sup>®</sup> recording and verification system. This software allows for daily treatment course follow up, note viewing and accounts for the existence of corrective actions over initial patient schedule. Statistical analysis has been performed with Stata<sup>®</sup>.

**Results.** An amount of 153 patients have been analysed. 68% of these patients had their treatment prolonged by 1–5 days, 23% by 6–10 days and the remaining 9% by over 10 days. Only 1 patient completed treatment within the scheduled time, being the median 4 days and the interruption average  $5 \pm 4$  ( $k = 1$ ) days. Consequent loss of tumour control can be estimated between 1 and 13% (1.4% per untreated day). The main causes of the interruptions are bank holidays and machine servicing (30% and 40% respectively). Machine breakdowns account for 12% of the interruptions and the remaining 18% are due to toxicity, unattended treatments and non specified causes. For 3.3% of the patients compensatory measures were undertaken; in every case the preferred clinical option was the administration of additional sessions.

**Conclusions.** Treatment interruptions are unavoidable, and compensatory actions seem scarce. Lack of logistics and resources difficult the implementation of some compensatory proposals in our centre. It is suggested the elaboration of guidelines and the implementation of audits in order to evaluate present handling of interruptions in our country and adopt a commitment to improve this aspect of clinical practice.

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### Online cone-beam CT-guided corrections daily in the treatment of prostate cancer patients

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**Background.** Safety margins are significantly reduced by image-guided radiotherapy (IGRT) technology for prostate cancer. Cone beam computed tomography (CBCT) is a new technology that permits the acquisition of 3-dimensional (3D) volumetric images while the patient is in treatment position. CBCT daily is use in our center to daily localization of prostate cancer. It's important to assess their use.

**Objectives.** The objective of this work was to assess the daily online CBCT corrections and the discrepancy with offline CBCT retrospective corrections.

**Methods.** CBCT images were obtained before 252 treatments. After positioning the patient using the skin marks, a CBCT scan was acquired and the setup error determined by fusing the prostate tissue on the CBCT and planning CT scans. After, the position was corrected by moving the couch accordingly. Corrections are made on-line by the technician. After start the treatment. An experienced observer retrospectively reviews the images and performs again the position corrections regarding acquisition.

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*Results.* Of 252 treatments, the mean (correction offline respect online values) in the longitudinal, vertical, and lateral dimensions were  $-0.03$  cm (SD 0.2),  $0.06$  cm (SD 0.2), and  $0.09$  cm (SD 0.1), respectively. The most frequent value was 0 in all dimensions. Subjectively it was observed that with lower quality images larger corrections were made. We could not measure this objectively.

*Conclusions.* The use of Three-dimensional IGRT with CBCT daily, results in more easy and precise target localization for all the professionals that participate on treatment.

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