absolute dosimetry was checked, and the calibration film was scanned.
The document-scanner creates highly reproducible values. In the range of optical density necessary for quality assurance procedures the difference of the fitted curves is generally below 5cGy comparing step-wedges and multiple films with single fields in different depth. No difference in dose measured was found for single and fractionated irradiations. Films irradiated in their envelopes are less sensitive then those removed from them.
Document-scanners and radiographic film can be used for quality assurance in radiation therapy. An error of about 5cGy can occur.

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Dose error contribution in film dosimetry due to interference effect using a document scanner.

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Introduction: Recent radiotherapy techniques, as Intensity Modulated Radiotherapy (IMRT), reinforce the need of exhaustive QA protocols. In this context, film dosimetry has acquired a special relevance due the integrating character of this technique. According to the experience, document scanners have proven to be sufficiently trustworthy for this task and economically more profitable. In this work we face the study the light interferential problem that can arise in the acquisition of images when using this type of device.
Material and Method: Radiographic film EDR2, manufactured by KODAK, has been used. For image acquisition we employed a scanner ARCUS 1200, manufactured by AGFA, and an in-house software for analysis. Studies of noise by means of multiple acquisitions were made to estimate the standard deviations (σ) of each pixel of the digital image. In addition, by using the colour scales the details of the undergone interferences were obtained. Finally, the same evaluation was made by removing the plate glass causing this perturbation.
Results: In the study with the plate glass, the interferences were associated to areas of σ maps for which the standard deviation achieved higher values. The ratio of σ_{mean} measured with and without interferences between equivalent zones, was 1.49, meanwhile removing the plate glass, the interferences no longer appear. The relation between σ_{mean} with and without the plate glass, was of 1.60.
Conclusions: Although document scanners are valid for dosimetry, it is advisable to avoid the contact of the plate glass with the films. This disadvantage is associated to this hardware and therefore, the glass removal would lower the average value of the error and avoid the interferences.

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Verification of the intensity modulated radiation therapy treatments (IMRT): methodology of Hospital Albert Einstein-São Paulo

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The modern radiotherapy demands accuracy in the administration of the radiation dose with consequent reduction in the dosimetric errors. The verification of the absolute dose and the distribution of the dose are recommended in the procedures of intensity modulated radiation therapy (IMRT). From August 2001 to 2005 a total of 432 patients were treated with IMRT, 249 prostate cases, 54 head and neck, 90 brain, 17 pelvic tumors, 15 abdomen and 7 of others sites.
The present work describes the methodology and quality assurance for IMRT implemented at the Albert Einstein Hospital-São Paulo since August 2001. All plans were verified in terms of absolute dose, at least on central axis, using calibrated ionization chamber (IC) and a solid-water phantom. All fluencies were checked in terms of relative distribution using dissymmetric films (KODAK X-V and ERD-2).
The IMRT plan of each patient was integrally transferred for a phantom, with the center of the field in the IC at a depth of 10cm. The calculated dose was normalized at the dose average inside the IC volume. Three types of IC were used, PTW 0.6cc, RK83 0.12cc and micro-chamber Exradin A16 0,007cc. The data are verified in a homemade spreadsheet, containing the following data: field parameters; IMRT factor; prescription dose; isodose; and dose fraction calculated by the treatment planning system (TPS) for each field. Inputting the readings, the spreadsheet supplies the absolute dose measured, the dose contribution of each field and the deviation between the measured and prescribed doses. At the same time dosimetric films were irradiated for summed and individual fields to get the fluencies map. Using a dosimetric film system (Skanditronix) the relatives isotope map were compared to plane dose distribution from TPS, in terms of relatives isodoses shape and hot or cold spots. At beginning of 2005 we started the isotope evaluation using Gamma Function, with the PTW Versify system.
The variation between the calculated dose from the TPS and the measured was acceptable (1.52±1.20). For head and neck and brain fields with reduced fields or with high dose gradients the use of micro-IC was necessary. The distribution of relative doses measured with films was shown acceptable when compared with the isodose of TPS, especially to verify the hot or cold spots. The evaluation was done for individual fields and also for the summed fields irradiated in a phantom. With the Gamma Function the quantity of the film evaluation was improved.

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A Comparative Study of Polymer Gel and Film Dosimetry in Intensity Modulated Radiosurgery Dosimetric Verification

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Stereotactic radiosurgery is a widely-used treatment involving precision delivery of radiation beams for treatment of tumors located close to critical intracranial structures. By offering increased dose conformity, Intensity Modulated RadioSurgery (IMRS) can give improved results with significant reduction in dose to these neighboring critical structures. However, to assure the quality of the whole treatment procedure, experimental dose verification of IMRS in three dimensions with high spatial resolution is advantageous. To this end, polymer gel dosimetry is an inherently 3-dimensional, tissue-equivalent measurement technique. The aim of this study is to investigate the feasibility of using nomoxic polymer gels for IMRS verification. In this study we report on our initial experience with nomoxic polymer gels as a dosimetric tool.
The polymer gel was manufactured at room temperature under a fume hood and with atmospheric oxygen levels. A spherical glass flask was filled with polymer gel and fixed at the center of a small polystyrene box. The remaining space of the box was filled with water and inserted in an AVID Universal Phantom (MDX Medical Inc., Vancouver, BC, Canada). The IMRS inverse planning was performed using