

In this issue

The first article in this issue is a literature review, by Warren and Eddy, in which the authors explore the impact of using magnetic resonance imaging (MRI) in the treatment of cervical cancer with brachytherapy. It is written from the perspective of current departmental practice in the UK and aims to highlight the issues associated with using MRI as a tool for image guided brachytherapy planning. A literature review was undertaken focussing specifically on the use of MRI in brachytherapy treatment planning for cervical cancer. Results from planning case studies and clinical series were analysed, and the literature showed that image guided brachytherapy treatment planning is a promising development. MRI assisted planning could theoretically be implemented in centres that have access to a MRI scanner. Alternative brachytherapy technologies and alternative radiotherapy modalities were not found to be superior in effect or in ease of implementation. Although MRI shows great promise, the evidence base for MRI in brachytherapy planning for cervical cancer is currently limited and therefore careful implementation and evaluation is required. It is suggested by the authors that new methods of working are devised to ensure consistency and quality in implementation and delivery, and that outcomes are measured and audited to evaluate efficacy.

In the second article, Young and Blyth, explore treatment set up accuracy using daily portal imaging during radiotherapy for patients with spine and bone metastases. It is well established that patients with bone metastases get good pain relief from radiotherapy. The aim of treatment is to achieve maximum pain relief with minimum morbidity. Accuracy and reproducibility of the patient's position are fundamental to the successful delivery of radiation therapy. A previous study carried out in their department showed that the use of only a single tattoo for the set-up of palliative patients resulted in poor accuracy. The aim of this study was to assess if the addition of

extra skin marks improved the set-up accuracy of palliative patients being treated for spine and bone metastases. A protocol was implemented detailing the extra skin marks to be used. Daily portal images were acquired and analysed retrospectively using anatomy matching. The results obtained were then compared with those of the previous study. The use of extra skin marks resulted in a total of 45 % of images within 5 mm tolerance compared with 36 % of images in patients treated with a single centre tattoo. Also the number of images with deviations greater than 15 mm was reduced by more than 50 % with the addition of extra skin marks. This study has shown that extra skin marks do increase the set-up accuracy in palliative patients treated for spine and bone metastases. Therefore, the practice of using extra skin marks has become standard protocol for all palliative patients within the department.

In the next article, Wright et al., consider and review the ethical and practical considerations and issues associated with using focus groups as a means of data collection in radiation therapy research. Focus groups are a means of gathering qualitative data from a group of participants who discuss a given topic. This method has been used in health care research for the past thirty years, but has seen limited use in radiation therapy research. Focus group discussions are a useful tool for investigating a variety of educational, training and clinical issues from the perspective of practitioners, students and patients. In particular, it addresses some of the decisions which have to be made about group composition and conduct of the discussions. The literature review is contextualised using a recent example of how the authors used focus groups to investigate fitness to practice in radiation therapy. Other challenges such as familiarity between participants and researchers, power relationships and anonymity are addressed. The paper concludes with a consideration of data analysis.

In the next paper, Kris Armoogum reviews the effect of smoothing on treatment plan efficiency in IMRT - Eclipse Helios™ dose optimisation. In this study, the effect of varying the X-Y smoothing values on the average leaf pair opening, monitor units factor and total number of monitor units in a cohort of 20 prostate and head and neck patients treated with dynamic IMRT. The treatment plans were created using Varian Eclipse™ TPS (v 8.9.09). Clinically approved and dosimetrically verified plans were used as a reference plans. These were re-optimised varying the X and Y smoothing parameters from 0 to 100 in various combinations.

Set up error in radiotherapy is the topic of the next paper, the authors Das et al., undertakes a prospective study into the comparison of geometric uncertainties between alpha cradle and thermoplastic ray cast immobilization in abdomino-pelvic radiotherapy. Set up error significantly affect the accuracy of treatment and outcome in high precision radiotherapy. Set up error was compared by using digitally reconstructed radiograph as reference image with electronic portal image taken during the treatment. Statistical analysis used: The total errors in mediolateral, craniocaudal and anteroposterior directions were compared by t-test. For systematic and random errors variance ratio test (F statistics) was used. Margins were calculated using ICRU, Stroom's and Van Herk's formula. The authors conclude that geometric errors and CTV to PTV margins are different in different directions. For abdomen and pelvis in alpha cradle immobilization the margin ranged from 8 mm to 12.4 mm and for ray cast it was 8.2 mm to 13 mm. Therefore a margin of 10 mm with online correction would be adequate.

In the next study, authors Parsons, Begley and Herst, investigate the effect of manuka honey

on the extent of oral mucositis in head and neck patients in New Zealand. Oral mucositis is an unavoidable side effect of radiation therapy to the head and neck which can compromise patient health and quality of life. This A total of 28 patients were recruited; 10 patients received standard care and 18 patients were given additional manuka honey. Honey was used three times a day, assessment included: extent of oral mucositis using a multi-site mucositis scoring system, weight and quality of life. The first six patients randomized to the honey arm, used undiluted honey and pulled out in the first week because of extreme nausea, vomiting and stinging sensations in the mouth. The next 12 honey patients used a honey mouthwash (diluted 1:3). Six of these patients completed the trial and four more completed the first 4 weeks of the trial. Eight control patients completed the trial. In contrast to previous honey trials in Malaysia, Egypt, Iran and India, diluted manuka honey did not decrease the extent and onset of radiation-induced oral mucositis but did appear to ameliorate radiation-induced weight loss and increase quality of life in the absence of cisplatin chemotherapy.

To complete this issue, Uetake et al., present a case study on a rare case of multiple myeloma in a 60-year-old man, in whom relapse limited to the irradiated area in the left lobe of the liver developed following radiotherapy for lesions in thoracic vertebrae 11/12. Immunohistochemical analysis revealed expression of hepatocyte growth factor (HGF) and c-Met in the hepatocytes in the irradiated area of the liver. The authors speculate that the malignant plasma cells might have proliferated in response to local increase of HGF production in the irradiated liver. The role of HGF in the extra osseous spread of multiple myeloma and also under the experimental condition of hepatic transplantation is discussed.