

In this issue

In the first article of this issue, Pattinson and Jessop investigate the delivery of health improvement information to patients during radiotherapy treatment. The burden of lifestyle associated disease is increasing with a preventative approach to health becoming more of a focus. Within the oncology setting the importance of supporting patients with positive lifestyle changes post treatment is included within the recently developed recovery package and the contribution of therapeutic radiographers (TRs) will be significant in the implementation of this. A 23-question survey tool was distributed via the online platform survey monkey. The questionnaire was promoted online through the Society and College of Radiographers (SCoR). All members of the SCoR had access to the questionnaire to allow for assessment of health improvement provision nationally. Quantitative and qualitative data were acquired and analysed using the statistical package for the social sciences, descriptive statistics and thematic analysis. Results found that TRs recognise the importance of health promotion. Highest levels of provision were observed with smoking cessation and lowest levels of provision observed on the topic of exercise. Key barriers identified were staff responsibility and lack of knowledge and training of TRs.

The authors found that health improvement is part of the role of the TR and is delivered within UK radiotherapy departments; however there is scope to increase delivery with the identification and overcoming of barriers to provision.

In the next paper, Smith, Estoesta, Kader, Martin, Claridge Mackonis, Toohey and Carroll undertake a comparison of conventional Simultaneous Integrated Boost (SIB) planning technique with a hybrid SIB intensity modulated radiation therapy (IMRT) technique with varying open tangent to IMRT field dose ratios. They also investigated which of the dose ratios

proves the most favourable as a class solution across a sample. In total, 15 patients with conventional SIB treatment plans were re-planned with hybrid SIB IMRT technique using three differing Open field: IMRT dose ratios, that is 80:20, 70:30 and 60:40. Plans were compared using dosimetric comparison of organs at risk (OARS) and homogeneity and Conformity Indexes across target structures. Findings of the study were that hybrid plans produced superior dose conformity, homogeneity, reduced dose maximums and showed an improvement in most OAR parameters. The 70:30 hybrid technique exhibited greater benefits as a class solution to the sample than conventional plans due to superior dose conformity and homogeneity to target volumes.

In the next article, Goldsworthy, Tuke and Latour, undertake a study to consult patients about their experiences of comfort while wearing a thermoplastic mask during head and neck radiotherapy before designing a study to develop a comfort scale for radiotherapy. A qualitative method using a focus group of patients receiving radiotherapy for head and neck cancer was deployed. Five patients were invited and agreed to participate. Semi-structured questions guided the focus group interview. Thematic analysis was used to identify themes. Three main themes were identified: physical comfort; mental perception; and passivity. The authors concluded that the insight of patient's comfort and experiences are valuable for clinicians to provide patient-centred care. Findings of this study implicate further investigation of how the themes of patient comfort can be measured in radiotherapy to improve the patient experience.

In the next paper by Walsh and Craig, authors investigated the factors affecting continuing professional development (CPD) participation in radiation therapists and diagnostic radiographers

and their knowledge and attitudes towards regulatory body registration. Online surveys were designed and made available on the Irish Institute of Radiography and Radiation Therapy (IIRRT) website for IIRRT members. The responses were analysed using descriptive statistics and χ^2 -tests in a statistical computer programme. Authors conclude that CPD must be developed in radiation therapy and diagnostic radiography. Funding, time and increased staffing could result in effective implementation of CPD. Regulatory body registration has been communicated but more information regarding the process is required.

In the paper presented by Sangudsup, Ua-apisitwong, Kaewchur, Teeyasoontranon, Klunklin and Chawapun, authors undertook a comparison of IMRT treatment planning between using positron emission tomography/computed tomography (PET/CT) and CT for target volume delineation in patients with non-small cell lung cancer (NSCLC).

Nine NSCLC patients with PET/CT images were enrolled into this study.

Gross tumour volumes were delineated by the PET visual assessment, the automated PET; standardised uptake value (SUV) 2.5 (PET2.5) and threshold 40% SUVmax (PET40), and CT-based method. For each patient, two IMRT treatment plans based on CT and PET/CT delineation were performed. The target coverage and the dose volume parameters for organs at risk were analysed.

The authors conclude that PET/CT enables more accurate assessment of tumour delineation for NSCLC therefore improve target coverage in IMRT plan.

In the next paper, Almatani, Hugtenburg, Lewis, Barley and Edwards, study the simplified material assignment for Cone-beam CT (CBCT)-based dose calculations of prostate radiotherapy with hip prostheses. CBCT images contain more scatter than a conventional CT image, therefore provide inaccurate Hounsfield units (HU). Consequently CBCT images cannot be used directly for dose calculation. The aim of

this study was to enable dose calculations to be performed with the use of cone-beam derived CT images. The multilevel threshold algorithm was used to categorise pixel values in the CBCT images into segments of homogeneous HU. The variation in HU with position in the CBCT images was taken into consideration and the benefit of a larger number of materials has been explored. This segmentation method relies upon the user defining the size of individual volume on a multiple slice by multiple slice basis. The result showed that two values of HU were needed to improve dose calculation accuracy for a phantom. In challenging circumstances such as that of a prostate patient with hip prosthesis, five values of HU were found to be needed, giving a reasonable balance between dose accuracy and operator time.

In the next paper, Schembri, Mercieca, Courtier and Zarb study the impact of breast size on mean lung dose (MLD) for patients receiving tangential radiotherapy to the whole breast. Chest wall separation (CWS), volume of tissue receiving 95% isodose and MLD were measured on 80 radiotherapy treatment plans of patients receiving tangential radiotherapy treatment to the whole breast. Breast size was categorised as small (CWS < 25 cm and PTV < 1,500 cm³) and large (CWS > 25 cm and PTV > 1,500 cm³). Pearson's correlation and independent sample *T*-test were used to analyse data. This study demonstrated lack of correlation between breast size and MLD. Authors conclude that further research is recommended for justification of alternative techniques for this subgroup of patients to provide optimised radiotherapy delivery.

In the first of two literature reviews, authors Kanagaratnam, Shah and Anand review the literature on palliative radiotherapy for Merkel cell carcinoma and present the results of the treatment of patients with this disease at their cancer centre. A new palliative split-course hypofractionated has been used in North Middlesex University hospital in this cohort of patients. The purpose of this case series is to provide supporting evidence on the efficacy of this dose and fractionation regime and review the literature for the palliative management of

Merkel cell carcinoma. Four patients were treated with the palliative split-course hypofractionated regime. The regime consisted of an initial 20 Gray in five fractions over 1 week, a 2 week gap and then a further 20 Gray in five fractions over 1 week. Tolerability and response to treatment was evaluated by history and clinical examination. Authors found that the split-course hypofractionated regime was well tolerated, achieved excellent tumour regression and improved quality of life in all four patients. Since then, a further three patients have been successfully treated with the above regime. This case series demonstrates the efficacy of this dose and fractionation in a selected group of patients too frail for radical management and adds to the evidence base for the optimal palliative management of Merkel cell carcinoma.

In the next paper by Husak and Bridge, the authors undertake a systematic review of the literature to determine the potential role of proton therapy as a standard modality for craniospinal irradiation. A total of 14 articles were reviewed and findings conclude that proton therapy is a superior treatment option for craniospinal irradiation. The reduction in risk of toxicity and radiocarcinogenesis offered by proton craniospinal irradiation appear to outweigh the increased costs.

The educational note is presented by Montgomerie, Kane, Leong and Mudie, and is on the subject of using the virtual environment for radiotherapy (VERT) training in the classroom. This report discusses the approach to teaching undergraduate radiation therapy students in New Zealand using the VERT system. In conjunction with VERT being used to teach clinical skills, integration of conceptual knowledge occurs across all 3 years of the programme; this report gives examples of how this is achieved in practice.

The next paper is a technical note written by Demetrios Okkalides, on the subject of designing

a tool, a jig, designed to measure the accuracy of beam direction laser beams. Despite crossing at the isocentre, misaligned laser beams may cause significant positioning problems. The jig proposed here is to be used in addition to the quality assurance procedures employed with linacs and deals with possible misalignments of transverse lasers. The jig was simple to construct and has been found quite useful in practice. The accuracy of patient positioning will be restricted only by the size of the laser beam's cross-section.

In the first of two case studies, Neill Roberts uses his experience to present a comprehensive development framework for the consultant radiographer in oncology. The role of the consultant radiographer in radiotherapy is a relatively new concept and to date the number of post holders in these roles remains low. Despite challenges to role creation for the non-medical consultant, the benefits of role development and skill mix within the national health service are evident. Among these challenges is the need to ensure appropriate and credible training of the consultant radiographer. This case study focusses on the local experience of developing a suitable competency framework for the first consultant radiographer at the Leeds Cancer Centre, UK. It highlights elements of the framework that equip the post holder to carry out the role and how the governance underpinning such a framework could be used by other radiotherapy centres across the UK.

In the second case study, presented by Patel-Yadav and Singh, the authors report a case of the successful use of acupuncture-like transcutaneous electrical nerve stimulation (ALTENS) therapy 5 years after radiation treatment. This case report demonstrates a potential for offering ALTENS to those long suffering from radiation-induced xerostomia.

Angela Duxbury