

In this issue

This year the Journal is celebrating its 10th anniversary and we celebrate this milestone by publishing a series of guest editorials. The first editorial is presented by Tomas Kron, a principal research physicist at the Peter MacCallum Cancer Centre in Melbourne, Australia, on the subject of image guidance in the treatment room and he asks the question—can ten years of rapid development prepare us for the future?

In the first original article, Wilson, Colley and Beavis, discuss the use of carbon fibre couch inserts in external beam radiotherapy. The aim of couch inserts is to provide rigid and lightweight patient support, it is also perceived to be radiotranslucent implying that it does not interfere with the radiation beam. However, the authors present evidence in the literature which suggests that this perception may not be appropriate, particularly at oblique angles of incidence. In this study, the authors investigate and present their findings on the radiation attenuation and surface dose enhancement characteristics of the carbon fibre insert for the Varian ExactTM couch.

In the second article, Sherriff et al., examine the outcomes of patients with adenoid cystic carcinoma treated with post-operative accelerated hypofractionated radiotherapy. The authors identified 37 patients treated between 1997 and 2008, who were selected for retrospective analysis. Data collection included site of primary and surgical margin. Primary outcomes were overall survival and local control calculated using the Kaplan–Meier method.

In the next article, Armpilia et al., undertake a study to evaluate composite coplanar and non-coplanar three-dimensional conformal techniques for external-beam prostate radio-

therapy using a low-energy (6MV) photon beam.

Julie Hendry, presents the results of her study undertaken to explore breast cancer patient's experience of the radiotherapy pathway with a view to improving patient-centred services. Focus groups were used to explore the information, support and communication needs of women receiving adjuvant radiotherapy for primary breast cancer. Five main themes emerged: information, communication and support, dignity and individualised care, service accessibility and staff relationships. Generally, staff were viewed as professionals and the radiotherapy service well run although women did identify several unmet needs during radiotherapy, for example lack of information and perceived time constraints of busy staff was revealed.

Fung and Cheung, undertake a review of the literature based on the use of image-guided radiation therapy using computed tomography in radiotherapy. The authors outline the applications of this technology and its benefits in producing treatment accuracy. They review four types of computed tomography-based image guidance systems and their working principles. The system characteristics and clinical applications of the helical, megavoltage, computed tomography, and kilovoltage, cone beam, computed tomography systems are discussed, given that they are currently the most commonly used systems for radiotherapy verification. The article also focuses on the recent techniques of soft-tissue contrast enhancement, digital tomosynthesis, four-dimensional fluoroscopic image guidance, and kilovoltage/megavoltage, in-line cone-beam imaging.

Akber and Kehwar present a novel approach to assess mean lethal radiation dose with water proton spin lattice relaxation times. The assessment of mean lethal radiation dose in human organs, using multi-target and linear quadratic models, with water proton nuclear magnetic resonance spin lattice relaxation time yields a correlation coefficient of 0.90 and 0.82, respectively. Results of this study reveal that as the spin lattice relaxation time increases, the mean lethal radiation dose decreases.

Sale, French and Voss present a case report on personalising margins for bladder radiotherapy. The authors introduce a case study on the introduction of adaptive radiotherapy at the Andrew Love Cancer Centre in Australia. Invasive bladder cancer treated with external beam radiotherapy generally has poor local control rates, however, with the introduction of cone-beam computer tomography and adaptive treatment, there is potential for improvements in disease control and reduced toxicities.

Professor Angela Duxbury