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# In this issue

In this issue there are seven original articles covering a range of themes and topics including a study on the use of the virtual environment for radiotherapy training, alternate approaches to image guidance, the evaluation of adaptive radiation therapy, different treatment modalities in practice and two articles concerned with the treatment of patients with breast cancer. To complete this issue, there is a case report on lung cancer presents as Addisonian crisis secondary to solitary pituitary metastasis and a short communication on reducing the skin dose from secondary electrons in kilovoltage radiotherapy.

The first article introduces one of the first studies undertaken on the use of the Virtual Environment for Radiotherapy Training (VERT), a system that employs projection of stereoscopic immersive 3D images back projected onto a large screen. In this article, the authors Flinton and White introduce the concepts of using virtual environments in training and they raise the issue that there is evidence linking these systems to adverse side effects that mimic motion sickness. In this study the authors identify if there are side effects experienced by learners when using this virtual learning environment.

In the second article, Willis *et al.*, from the Peter MacCallum Cancer Centre in Melbourne, discuss the use of megavoltage versus kilovoltage image guidance and accuracy in head and neck cancer intensity modulated radiotherapy (IMRT). In this study the authors compare these imaging systems with a phantom accuracy study and retrospective analysis of imaging workload in head and neck IMRT.

Adaptive radiation therapy is a promising concept that allows individualised, dynamic treatment planning based on feedback of measurements. The TomoTherapy Planned Adaptive application integrated to the helical TomoTherapy planning system, enables calculation of actual dose delivered to the patient for each treatment fraction according to the pre-treatment megavoltage computed tomography (MVCT) scan and image registration, so new fractionation plans are available if correction is necessary. In this article, Fan-Chi Su *et al.* discuss the need to apply a biological dose parameter and present their findings of a study undertaken on four lung patients' adaptive plans.

In the next article, Swamy, Ashamalla and Guirguis from New York Methodist Hospital, Cornell University, present their findings on their large study to explore the variations among radiation oncologist across the United States in managing early-stage breast cancer, specifically radiation-induced skin reaction (RISK). Although there appears to be an overall congruence on the doses and techniques of radiation delivery, the management of RISK is varied. The authors conclude that efforts are warranted to standardise practices in order to practice evidence-based medicine in a cost-effective manner.

The theme of breast cancer continues in the next article by Kars *et al.*, where the authors present their work on examining the factors associated with the development of radioresistance in drug resistant human MCF-7 breast cancer cells. The authors argue that even when the breast tumour is treated intensively, women diagnosed with breast cancer may develop a recurrence which may be in the form of distant metastasis. This study demonstrated that some of the multi-drug resistant cancer cells may also become radioresistant.

Passi *et al.* examine high-dose-rate brachytherapy with external beam radiotherapy in the treatment of carcinoma of the cervix: a dosimetric and radiobiological analysis. The aim of this study was to find out equivalence between two high-dose-rate (HDR) fraction schemes, relevance to the International Commission on Radiation Units (ICRU) and Measurements report-38, reference volume with respect to point A dose and other ICRU reference points in 2D planning.

The next article is a Case Report presented by Turaka, Parsons and Buyyounouski from Fox Chase Cancer Centre in Philadelphia. The authors present a case of a 68-year-old man who presented with lung cancer in Addisonian crisis due to a pituitary metastasis. He was successfully treated with radiotherapy which reverses his visual field deficits. The authors argue that although pituitary metastasis as the first manifestation of malignancy is rare, but should be considered in the differential diagnosis of patients presenting with disturbances and visual problems.

To complete this issue, there is a Short Communication on reducing the skin dose from secondary electrons in kilovoltage radiotherapy. In this article, Thomas and Clark summarise the physical processes leading to the increased surface doses when using lead cut-outs to shape fields in kilovoltage radiotherapy and undertake an empirical investigation of the efficacy of various coatings in reducing the skin dose generated by secondary electrons released in the lead during irradiation. A new flexible coating for lead cut-outs has been formulated and tested.

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