

A level 3 dosimetric intercomparison for Australasia: a pilot study

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In addition to the absolute calibration at a reference point a variety of factors influence the dose delivered to patients undergoing radiotherapy. A level 3 dosimetric intercomparison using an anthropomorphic phantom and realistic treatment scenarios can test factors like patient data acquisition, treatment planning, set-up and delivery. The present study aims to demonstrate the feasibility of such a dosimetric service within Australasia (Australia and New Zealand) and establish baseline data and action levels. Twelve radiotherapy centres in Australasia have been invited to treat an anthropomorphic phantom using two different treatment scenarios based on current clinical trials of the Trans Tasman Radiation Oncology Group (TROG): a two field treatment of a carcinoma of the tonsil, and a four field prostate treatment. The dose distribution is assessed in two consecutive treatments using thermoluminescence dosimeters (TLDs) placed throughout the target volume and in 'critical' structures such as the lens of the eye or the rectum. Preliminary results from eight centres confirmed the dose delivered and demonstrated the feasibility of such a service at a cost of approximately \$US 500.- per centre. For the prostate treatment, the variability of dose amongst the centres increases from a calibration under reference conditions (1.3%, 1SD) to 2.7% and 4.6% for ICRU reference point and mean target dose, respectively, which indicates the need for level 3 dosimetric studies.