

An evaluation of a computerised dose compensation system (ParScientific) used in conjunction with a 3D CT-based treatment planning system (Cadplan) was undertaken. Initial acceptance of the system confirmed a geometric accuracy of better than 1mm. Several materials were investigated for suitability of use to make the compensators. 2.5 mm diameter steel shots were found to be optimal. Attenuation coefficients for this material for a range of field sizes were determined. Phantoms were designed and constructed to test the accuracy of the dose compensation algorithm. These fall into two classes: i) geometric phantoms to test for missing tissue compensation and ii) dosimetric phantoms, incorporating inhomogeneities, to test for dose compensation. These phantoms were CT-planned and irradiated with and without compensation. Film dosimetry was used to determine the uniformity of the dose delivered. These results were compared to dose distributions obtained using the treatment planning system. A similar verification procedure of the system was performed using a Rando phantom irradiated for sites which normally require use of compensators (e.g. head and neck). Finally a monitor units calculation routine was developed to enable clinical use of the system. At each step of the process, results of the tests indicated levels of accuracy which make the system suitable for clinical use.