AbstractID: 1106 Title: To Evaluate the Absolute Dose Calculated by CadPlan in an Anthropomorphic Phantom

Purpose: The purpose of this study is to verify the accuracy of absolute dose calculated by CadPlan in an anthropomorphic phantom.

Material and methods: The anthropomorphic phantom was irradiated with a single portal in skull region and in lung region separately using 6 MV photon beam. TLD-100 chips were implanted into phantom along the central axis to measure absolute depth doses. CT images of phantom were exported to CadPlan for calculating depth dose. Absolute point doses were calculated by Monte Carlo and by CadPlan, with the same CT images, beam geometry and monitor unit. TLD chips in the phantom were also irradiated under the same conditions (Fig. 1, 2).

Results and discussion: The average difference of absolute dose evaluated at central depth points between measurement and calculation (Monte Carlo) is 1.4%, range of 0.2% - 2.4%, in the skull region (Table 1), and is 1.2%, range of 0.2% - 2.9%, in the lung region (Table 2). These results show the accuracy of the Monte Carlo method.

For a comparison of the results between CadPlan and Monte Carlo, the average difference is 2.5%, range of 1.7% - 3.1%, in the skull region and is 2.2%, range of 1.6% - 2.5%, in the lung region (Table 1, 2).

Conclusions: From this study, doses from CadPlan are over that from Monte Carlo by about 2.4% in average in the heterogeneity phantom. It is acceptable in clinical application for CadPlan system and Monte Carlo method.