

AbstractID: 2072 Title: CT dose from daily in-room CT-guided radiotherapy

In-room CT-guided radiotherapy can provide 3D anatomical information of the positions and shapes of the targets and critical structures, allowing precise patient setup and the potential for on-line or off-line adaptive radiotherapy. Although the radiation dose from a single diagnostic CT scan is usually low and can be ignored during therapeutic radiation treatment, the repeat use of CT scanning for daily patient setup may present a concern of additional risk of radiation-induced secondary malignancy. We performed TLD CT dose measurements in a pelvic, a thoracic, and a head and neck Rando phantom at variable depths. All CT scanning parameters were selected from existing scan protocols and were not optimized to reduce CT dose. After correcting for energy dependence in the TLD measurements, the CT dose was found to be 1-2 cGy for the pelvis, 1.5 cGy for the thoracic region, and 1.2 – 2.5 cGy for the head & neck sites. The dose distribution at different depths in the phantom appears to be constant, although the dose in the middle of the phantom lung receives about 10% higher dose than near the chest wall. For a 42-fraction prostate cancer treatment, the total daily CT dose is approximately 63 cGy (0.8% of a target prescription dose at 75.6 Gy). We found that the total daily CT dose was comparable to the dose delivered by standard clinical practice of weekly portal filming.