Purpose: To assess the dose from kilovoltage cone beam CT from two image acquisition protocols, pelvis and head and neck, by addition of the dose to the patient treatment plans.

Methods: A total of 20 patients (10 pelvis and 10 head and neck) undergoing radiation therapy were selected and the dose from kV CBCT was calculated using a treatment planning system previously commissioned for this purpose. The imaging dose was added to the CT images used for treatment planning. Daily shifts as a result of imaging were recorded and applied to imaging beam whenever the sum of the shifts exceeded 0.5 cm. The kV CBCT dose can also be computed prior to planning, in case of IMRT treatments, and used during optimization.

Results: The additional dose as a result of daily CBCT is in the order of few cGy for head and neck and up to 90 cGy for the pelvis cases using the standard head and neck and pelvis protocols. The pelvic dose is especially dependent on patient size, being higher for smaller patients. Due to the low energy of the kV CBCT beam, the maximum energy deposition is at or near the surface with the highest dose being on the patient's left side for the head and neck and on the posterior for the pelvic cases.

Conclusions: Dose from daily kilovoltage CBCT can be added to patient treatment plans using previously commissioned kV CBCT beams in a treatment planning system. In the case of IMRT planning, optimization can be done accounting for kV CBCT dose.