

**Purpose:** The aim of this study was to analyze the daily setup variations for various anatomic sites with kV x-ray volume images and to suggest optimal margin guidelines for these anatomic sites.

**Methods:** Fifteen cases including three whole brains, three heads and necks (HNs), two lungs, three abdomens (two livers and one pancreas), and four pelvic cases were selected for this study. The images generated by kilovoltage cone beam computed tomography (kV CBCT) were overlapped with reference images by helical CT simulator and were analyzed and corrected with three shifts (anterior-posterior, right-left, and superior-inferior directions) range before each interfractional radiation treatment delivery. Additionally, source to skin distance of patient surface was recorded and compared weekly. For precise image guided radiation therapy (IGRT), our image detectors were installed in the relatively less than 1mm.

**Results:** In results, after correction of kv CBCT and reference images, values in patient surface for whole brain, HN, lung, abdomen, and pelvis were 1.5 mm, 2.4 mm, 5.0 mm 5.4 mm and 3.8 mm, respectively. The interfractional setup errors based on kV CBCT were analyzed and the suggested mean values for whole brain, HN, lung, abdomen, and pelvis in the vertical, lateral, and longitudinal directions were each 1.22 mm, 0.86 mm, and 1.18 mm, 1.57 mm, 1.52 mm, and 2.53 mm, 4.9 mm, 2.28 mm, and 3.65mm, 2.63 mm, 2.58 mm, and 2.34mm, 3.05 mm, 2.01 mm, and 2.44 mm.

**Conclusions:** Conventional radiation treatment depends on 2D and external surface marker is not good the setup verification rather than kV CBCT image with 3D. Daily setup imaging could be decreasing the planning target volume (PTV). Ultimately, the dose delivered to the surrounding healthy tissue and critical organs should be minimized during the radiation treatment period.