

AbstractID: 3655 Title: Use of CT based IGRT for daily set-up of frameless fractionated stereotactic patients.

**Purpose:** To compare orthogonal port films against CT based Image Guided Radiation Therapy (IGRT) for patient isocenter verification and assess the use of CT based IGRT for daily patient set-up.

**Method and Materials:** Eleven patients with brain metastases were CT'd for each of their fractionated radiosurgery treatments. The patients were immobilized in the supine position with a stereotactic head cast. Two of the patients had a bite block in their cast to minimize rotational movement. The daily CT was taken on a SOMATON Emotion Duo CT on rails and the treatment was delivered by a SIEMENS PRIMUS linear accelerator (linac). The daily CT images were then fused to the planning CT using fiducial markers and anatomy as guides. The shifts in the X, Y, and Z directions were computed by the Coherence Dosimetry Workstation and the patient was shifted accordingly to within 1 millimeter accuracy.

**Results:** We assessed the accuracy of the orthogonal port film technique against the CT based IGRT for 8 frameless stereotactic treatments. The implementation of IGRT increased the importance of patient immobilization while decreasing the need for accurate initial patient set-up since the patient would be imaged immediately prior to treatment and corrections could then be made to the set-up. Furthermore it was observed that using a bite block inside the head cast significantly improved patient immobilization and decreased the magnitude of IGRT shifts.

**Conclusion:** Orthogonal port film validation of the isocenter is adequate for an accuracy of 5mm for frameless stereotactic treatments. CT based IGRT provides an adequate verification of the isocenter for frameless stereotactic treatments to within 2-3mm accuracy. Furthermore, CT proves to be of clinical benefit to the patient since the mean dose used for each CT was only .7cGy where port films use 3cGy each for the two orthogonal images.