AbstractID: 4672 Title: Importance of daily portal imaging for head and neck IMRT treatments

Purpose: To investigate the set up variation for head and neck IMRT patients based on daily portal imaging.
Method and Materials: Reproducible patient setup is critical to accurate delivery of head and neck IMRT. At our institution, these patients are immobilized using a head-neck-shoulder thermoplastic immobilization system (S-Type, Medtec) and a customized headrest. Orthogonal digital portal images are taken daily to check patient positioning and are compared with plan DRRs. Isocenter misalignments are corrected by the therapists using a couch shift, with a 3mm action level. Therapists also carefully examine patient positioning in the mask, especially shoulder position, and re-position the patient in the mask if considered necessary. Isocenter shifts and frequency of patient repositioning were investigated by review of record-and-verify records for 15 patients. The magnitude of the shoulder respositioning was evaluated for 10 patients by comparing portal images and plan DRRs for a point 8cm inferior of isocenter, which is typically located at C2.
Results: Isocenter discrepancies of 3mm or smaller were recorded for a median of 92.5% of fractions (range: 71.4 – 100%). Isocenter shifts larger than 5mm were only recorded twice (2 patients, 1 fraction each; 0.38% of all fractions). On the basis of pre-treatment daily imaging, patients were repositioned in the immobilization mask before treatment for a median of 14% of fractions (range: 3-34%). Fifty nine percent of these repositioning were for a shoulder shift of less than 5mm. Thirty percent, however, were for shoulder shifts of 1cm or larger.
Conclusion: With our current immobilization, daily isocenter positioning accuracy is excellent, while correct shoulder position is more variable. Frequent imaging of head and neck IMRT patients is essential to accurate delivery of therapy, with shoulder position an important factor.