

## AbstractID: 5184 Title: Statistical Consistency Reviews (SCR) as a Chart Checking Tool

**Purpose:** Chart checking is key in radiation oncology QA. AAPM TG 40, *Comprehensive QA...Oncology*, TG53, *QA for...Planning*, and *ACR Technical Standard... Therapy* address chart checking. They recommend verifying monitor unit (MU) calculations by a second person or method before delivering 3 fractions or 10% total dose. Time-consuming verifications are difficult for multiple beam, heterogeneity corrected 3D and IMRT isodoses. We investigate *statistical consistency reviews* (SCR) of common treatments as one of several chart-checking tools.

**Method and Materials:** We collect data (gantry and collimator angles, SSD, field sizes, weights, fractions, dose/fraction, depths, outputs, MUs) for sites. We investigate parameter statistical consistency for the same treatment to similar patients. We report prostate four field treatments (66.6 Gy or 74 Gy/37 Fx) and IMRT five-field (0, 75, 140, 220, 285 degrees) treatments (76 Gy/38 Fx).

**Results:** Four field prostate treatments are surprisingly consistent. SSDs varied about 3% and MUs about 6%. Average AP SSD was 87.9 +/- 1.9 cm (2%) requiring 47.4 +/- 2.5 (5%) MU for 45 cGy. Average lateral SSD was 80.7 +/- 2 cm (2.5%) yielding 63.3 +/- 2.5 MU (4%) for 45 cGy. IMRT treatments MU variations were about 20%.

**Conclusion:** How to use these data? Rather than check our historically accurate algorithm calculations against another algorithm, we review four-field prostate MU calculations against statistical norms. A recent patient's AP 57 MU were greater than three standard deviations above the norm, 47 +/- 2.5 MU. His AP 79 cm SSD was well below the norm, 87.9 +/- 1.9 cm. A planning error? No, he was just obese, but it illustrates the value of knowing average parameters. IMRT plans appear more consistent than expected; SCR may have value for IMRT plan reviews. Statistical data will be presented for other sites (breast, head/neck, etc.) commonly treated with consistent methods.