Purpose: To analyze the patient specific IMRT QA results at our institution over the past 3 years and evaluate the procedures and methods of our IMRT QA program.

Methods: 1466 patient specific IMRT QAs were performed at our institution from March 2009 to December 2011. The passing criteria for each IMRT QA are that 90% of all evaluated points must have a gamma =1.0. The gamma is calculated using the TPS calculated planar dose as reference and the reference value is 90% of the maximum dose in the plane. A dose threshold of 10% is used in order to remove very low dose points from the calculation. The planar dose and the measurements are computed and obtained using the actual beam angles. The measurements were performed on Varian linacs equipped with Millennium 80, Millennium 120 and High-Definition 120 MLC.

Results: The IMRT QA results were analyzed with respect to the linac, treatment site, number of beams, IMRT vs. TOMO vs. VMAT, and number of control points. The overall average gamma index value was 96.85% (±1.5%). Head and Neck had the lowest gamma index (95.97%) while brain had the highest (97.85%).

Conclusions: After evaluation of 700 patients, it can be determined that there are significant variations in the average measured gamma value based on treatment site, number of beams, machine type, and number of control points. This work provides a foundation for future analysis of possible underlying issues in the gamma value deviations for each comparison.