Commissioning an IMRT system refers to the initial verification by phantom studies that treatments can be planned, prepared, and delivered with sufficient accuracy. Our profession has struggled since the inception of IMRT to define what measurements to make and what degree of accuracy is sufficient. Two AAPM task groups have been dealing with complementary issues. AAPM TG 120 is finalizing a report on dose measurement techniques for IMRT validation. AAPM TG 119 is finalizing a report that recommends a specific set of tests for IMRT commissioning and presents the results of those tests from several institutions in order to illustrate the accuracy that is achievable. The report presents a methodology for other facilities to perform the tests and determine if their achieved accuracy is comparable to this reference baseline.

The TG119 tests pose a range of optimization problems requiring simple to complex modulation patterns. The tests include mock prostate, head and neck, and para-spinal geometries. Members of the group have planned and delivered the treatments using their local planning and delivery systems, and then assessed the resulting doses using broadly available dosimetry tools following a specified protocol. Measurements included ion chamber “point” doses and film dosimetry on selected planes for all fields irradiating the phantom. Institutions also evaluated dose distributions produced by individual fields using detector arrays, film, or EPID. Planar dosimetry results were analyzed with gamma criteria of 3% dose/3mm distance to agreement. The mean values and standard deviations of the results were used to develop confidence limits for the test results using the concept [Confidence Limit = |Mean| + 1.96 σ]. Other facilities can use the test protocol and results as a basis for comparison to this group.

Learning objectives for this presentation:
1. Describe the TG119 test suite, analysis protocol, and initial results.
2. Demonstrate how it can be applied by other facilities, including delivery with rotating gantries.
3. Provide examples of IMRT QA failures that can be identified and corrected using these processes.