

AbstractID: 1368 Title: IMRT Plans with Mixed Energies: An Efficient Method to Perform Patient Specific Plan Verification QA

Patient specific QA is a crucial step for maintaining the plan integrity from the planning stage to delivery. We present an efficient method to perform comprehensive QA of IMRT plans that are composed of beams that have different energies, energy mixed plans. Our method is based on a plan transfer from the patient CT study set to a phantom data set where a chamber measurement and a coronal KODAK EDR-2 film are compared to what the planning system computes. Although this method is commonly used today in clinical practice, we have extended that method in order to implement it for plans with mixed photon energies. We found that although the chamber measurements could be normalized to a reference field for each energy in the plan, the planar dose film needed further investigation for which was the appropriate film calibration method. We tested plans that were composed of 6 and 10MV beams and we compared doses of the film planar dose distribution calibrated via a sensitometric curve produced by each energy separately and a sensitometric curve produced by mixed energies energies. All the curves were determined for a set of fixed field sizes of known doses respect to a chamber. We concluded that in the case of the mixed energies calibration, the ratio of the monitor units for every energy in the plan to the total monitor units should be used for the dose determination. The steps of the entire QA method and results of several plans will be presented.