

Purpose: To validate Accuray Monte Carlo treatment plans in various heterogeneous phantom systems. **Materials and Methods:** Monte Carlo Dose Calculation algorithm is considered to be the gold standard as compared to the ray tracing algorithm especially in rapidly changing heterogeneous density structures as well as in obliquely incident beams and superficial targets. Three anthropomorphic phantoms loaded with radiochromic EBT films were used for the validation of the dose predicted by Monte Carlo calculations algorithm. Plans performed in MultiPlan (MP 3.1) system simulated lesions in head phantom, lung phantom and a breast phantom. The lung phantom was custom fitted to accommodate small stereotactic A16 chamber for absolute dose verification. Using fixed cones, plans were first obtained and optimized then, calculated in Monte Carlo using the same beam orientation and weighting with %0.5 calculation uncertainty. Six exposed EBT films crossing the target at various axes were used for relative and absolute dose comparison with the calculated dose. **Results:** FilmQA statistical analysis performed with 3% dose difference index and 1mm distance to agreement (DTA) criteria revealed an average pixel passing (Mean,SD) of 83(11)% and 94(10)% respectively with an average pass of gamma index 88(4)%. Consideration of small target volume and high dose gradient within the evaluated region, the high DTA is indicative of good dose prediction. Both film dosimetry and chamber dose value predictions were in agreement to within <2%. **Conclusion:** Both EBT film and small stereotactic chamber measurements confirmed Accuray Multiplan Monte Carlo algorithm to be highly accurate for heterogeneous and shallow skin depth dose prediction. This technique can be used to validate Accuray treatment plans.