

AbstractID: 1134 Title: Results and analysis by QARC of the IMRT benchmark required by the NCI for participation in clinical trials

The Quality Assurance Review Center (QARC) developed a benchmark case to evaluate an institution's ability to plan and QA IMRT treatments. The Advanced Technology Consortium reviewed and helped develop consensus evaluation criteria for the benchmark. In June 2002, the NCI mandated that every institution must satisfactorily complete this benchmark (or a RPC phantom study) before using IMRT to treat patients on NCI sponsored clinical trials.

The benchmark case consists of a PTV in the shape of a half annulus, 2.5 cm wide, surrounding but separated by 3 mm from a cylindrical OAR 2 cm in diameter. The goal is to deliver 100% of the prescribed dose to 100% of the PTV with the constraint that no more than 5% of the OAR is to receive more than 60% of the prescribed dose. The planned IMRT treatment must be transferred to a phantom and the dose measured.

QARC has received plans from eight commercial and one in-house system. All non-arc plans consist of 7-9 beams, most with beams approximately equally distributed in the axial plane. Most plans delivered  $\geq 95\%$  of the dose to  $\geq 95\%$  of the PTV while fulfilling the OAR constraint. For absolute dose QA, most institutions used a single ion chamber measurement; relative dose was commonly measured in one coronal plane with EDR2 film. In all satisfactory cases, the absolute dose agreement between calculation and measurement was  $\leq 4\%$  in the PTV.

Data and analysis will be updated to include benchmarks data submitted by June, 2004.