

This work reports on our experience commissioning an inverse treatment planning system (CORVUS, NOMOS Corporation, Sewickley, PA) for clinical implementation. This system uses a simulated annealing algorithm to calculate intensity modulated fields. The fields are then divided into a sequence of multileaf collimator (MLC) leaf settings. Three levels of testing were performed to ensure that the system can be used safely and accurately. These include; (i) checking the dose calculation model for a series of open fields; (ii) testing the dose model and the delivery system with several specially designed intensity patterns; and (iii) examining hypothetical phantom cases. The dose distributions for single unmodulated open fields were compared with water phantom scan data. The dose distributions of single or multiple intensity-modulated fields were measured using an ion chamber and films in a cylindrical water phantom and a cubic polystyrene phantom. In all cases examined, the measured and predicted doses were found to agree to within 4% at all points except for high gradient regions. Finally, a beam imaging system (BIS) was used to measure the intensity-modulated x-ray beam patterns in the beam's-eye-view. The BIS-measured images were then compared with a theoretical calculation based on the MLC leaf sequence files to verify that the treatment would be executed accurately and without machine faults. Excellent correlation was found. The results indicated that the Corvus system has considerable potential for clinical radiation treatment planning and delivery and may in the future reduce treatment complexity.