

Commercially available 3-D treatment planning systems claim to have an accuracy of  $\pm 2$  percent when compared to ion chamber measurements; however, few evaluations of these systems have been published. This study was undertaken to evaluate the dosimetric accuracy of the FDA approved ADAC Pinnacle<sup>3</sup> 3-D treatment planning system. The evaluation was performed using the Radiation Treatment Planning Dosimetry Verification Package developed by AAPM Task Group 23. The test package contains characteristic data for 4 and 18 MV x-ray units for modeling in the user's treatment planning system. For dosimetric verification, a series of measured doses at a variety of depths and off-axis positions are provided for thirteen test cases, which serves to isolate and benchmark different aspects of the dose computational process by direct comparison of computed and measured doses. A total of 563 points were calculated at depths ranging from 1 to 35 cm on the beam center axis, off-axis within the beam, and off-axis outside the beam. The calculated values are within  $\pm 2$  percent of measured values for 538 (95.6 percent) of the test points. Nineteen of the remaining test points (3.4 percent) are located in the buildup region of the dose curve and deviate from measured values by -8.9 to +12.8 percent. The errors are a result of the large dose gradient in the buildup region, where small deviations in the model produce large errors. The remaining six points not located in the buildup region are within +3 percent of the measured values.