

AbstractID: 7022 Title: Secondary calculation for reviewing MU from ADAC treatment planning system

Current standards of practice are based on the use of an independent secondary calculation to confirm the monitor units (MU) derived from the treatment planning system. Many users of ADAC Pinnacle treatment planning systems have found discrepancies of 10% or more between simple secondary calculations and the MU from the ADAC treatment planning system for highly contoured areas. This is especially true for tangential breast and chest wall calculations. The ADAC treatment planning system in general indicates the need for more MUs to deliver the same prescribed dose than does the secondary calculation. Secondary MU calculation methods are in general based on full phantom conditions. On the other hand, the MU from the ADAC treatment planning system is based on partial phantom scatter. As such, differences exist in TMR factors, off-axis wedge factors, and the phantom scatter factor. In order to systematically study the discrepancies due to phantom conditions, experimental measurements were performed with various percentages of missing tissue. The agreement between the experimental measurements and ADAC calculations agreed to within 2%. These measurements were used to obtain a correlated relationship between missing tissue and the dosimetric parameters used by ADAC. The lack of side scatter due to the sloping contour has been found to be the primary contributor to the differences in MU. As such, a relationship between correction factor and amount of missing phantom is established. This relationship when applied yielded secondary MU calculations whose values closely matched the ADAC treatment planning system. This paper will present the establishment of this relationship.