

AbstractID: 6587 Title: A manual MU check calculation procedure for step-and-shoot IMRT.

Purpose: Present a method to calculate IMRT plan weight or dose to a point from IMRT plan MU settings, capable of being performed manually or with a simple spreadsheet. Applicable to step and shoot IMRT plan MU check calculations. Show how this method correlates to QA measurement results.

Method and Materials: Employ beam data tables commonly available for calculating MU settings for 2D and 3D plans. Use simplifying assumptions on the beam equivalent size and the number of MU to apply to producing dose directly and from scatter or leakage to the point of interest based on geometric considerations. The procedure and assumptions will be described. The MU check results will be compared to the beam IMRT plan QA measurement pass/fail results. A 2D diode array was employed for IMRT plan QA measurements.

Results: 42 IMRT step and shoot plans have been evaluated. Plan point dose calculated with this procedure fell within 2.5% of the plan value for 35 of the 42 cases. None of these plans failed the measured QA criteria of 3% dose / 3.0 mm DTA gamma evaluation or the 5% point dose measurement criteria. 7 plans had MU point dose results differing by > 2.5%. 2 of these 7 plans failed either the dose measurement QA test or the gamma test.

Conclusion: This calculation method shows promise as a plan evaluation tool.