

AbstractID: 5914 Title: Clinical Implications of .decimal Solid IMRT with Pinnacle Treatment Planning System

**Purpose:**

Recently, the .decimal Solid IMRT solution has become available to Pinnacle users. We explored the implications of this solution and the appropriateness of its use in the clinic.

**Method and Materials:**

Using a Varian 2300EX with 120-leaf MLC, two Siemens Machines with and without 80-leaf MLCs, a variety of sites were explored and optimized plans determined for conventional MLC delivery and compared to the .decimal Solid IMRT solution where the ideal Open Density Matrices (ODM) from Pinnacle<sup>3</sup> is converted into an array of solid modulator thicknesses using the .decimal p.d software and re-importing them back into Pinnacle<sup>3</sup> for final dose calculation. We investigated the following key practical considerations:

- (1) What treatment machines would most benefit?
- (2) How does it impact the overall quality and efficiency in planning?
- (3) What are the cost benefits or revenue implications?
- (4) What safety precautions are necessary, i.e. with regard to R&V, Film or Ion Chamber QA?
- (5) How do treatment times and number of MUs compare to MLC based treatments?
- (6) How long does it take to implement the solution?
- (7) What treatment sites most benefit?

**Results:**

For the Siemens machines, we found reduction in the planning time, better quality plan and more efficient delivery, with less MUs, faster delivery times and improved agreement in film QA and IC measurements. For the Varian 2300EX with 120-leaf MLC, the need for solid IMRT was not significant but can prove useful when treating large sites, negating the need for splitting the fields.

**Conclusion:**

We the found that solid IMRT solution to be valuable asset to our clinic, allowing our clinic to increase the number of IMRT treatments and treatment sites, extend the life and usefulness of older non-MLC linear accelerators, provide better quality plans and reduced planning time.