

AbstractID: 1801 Title: Hybrid IMRT Plans – Combining Conventional and IMRT Beams – for Reduced Planning Time and Simple Beam Arrangements

IMRT facilitates creating treatment fields that produce a high degree of spatial modulation of the intensity across the radiation area. This is advantageous for plans using beams distributed around the target to achieve a highly conformal dose distribution. For some patient setups (e.g. breast, AP/PA, wedged pair) and tumor staging, conformality is less important than tolerance for setup errors, and reductions in planning time and total monitor units.

We have used Varian's Eclipse TPS to combine the intensity distribution of open beams, which produce gentle dose gradients, with IMRT beams to create hybrid fluence patterns. The degree of hybridization is controlled by the user as relative contribution to dose at isocenter. We compared conventional, IMRT and Hybrid IMRT plans for phantom and breast patient studies.

In phantom studies Hybrid IMRT reduced total MU's by 12%-33% compared to IMRT and by 50% compared to conventional wedged beams. In a study of 10 breast patients, conventional open plus IMRT tangents (Hybrid) had the same total MU's as conventional wedged field tangents (Tangents). Hybrid plans typically reduced dose gradients at the edge of the PTV by 50%-70%.

For efficiency in breast, forward planned field-within-a-field tangents (FIF) required 1.5 hours per patient compared to 15 minutes for Hybrid. For normal tissues ipsilateral lung volume > 20 Gy averaged 180cc, 125cc, 155cc for Tangents, IMRT and Hybrid, respectively; for left breasts, heart volume >30 Gy averaged 32cc, 9cc, 17cc respectively.

Hybrid IMRT is a viable class solution when conformality is not the primary objective.