

# PERIPHERAL DOSE OF TUNGSTEN POWDER COMPENSATOR BASED IMRT

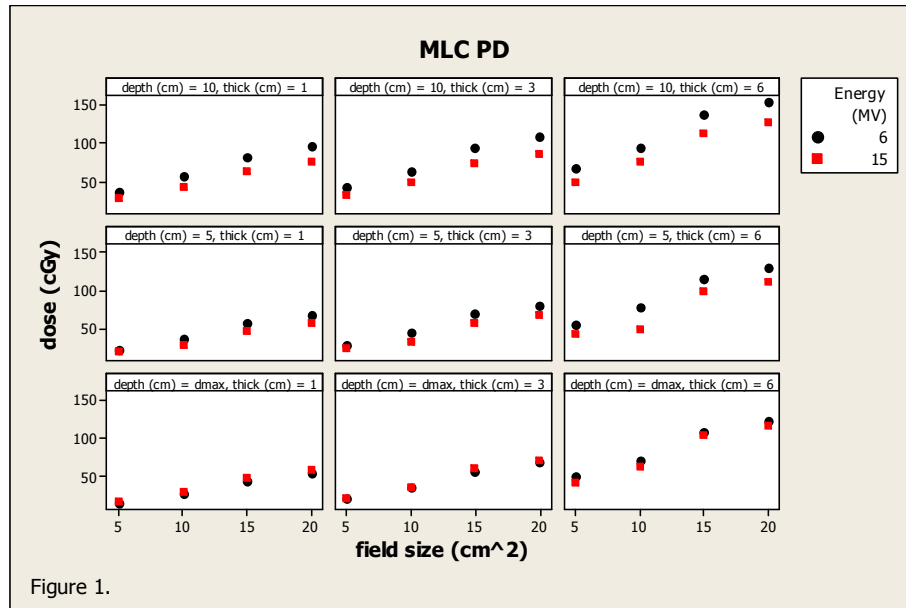


Figure 1.

Figure 1. Peripheral dose of an Elekta SLi multileaf collimator unit for 6 and 15MV beam energies. Results are normalized to a central axis dose 10Gy. Rows indicate measurements at depths dmax, 5 and 10cm. Columns indicate MLC measurements of virtual thicknesses 1, 3 and 6cm. Peripheral dose increases linearly with field size and is energy dependant only for the larger depths where the peripheral dose becomes greater for 6MV than for 15MV.

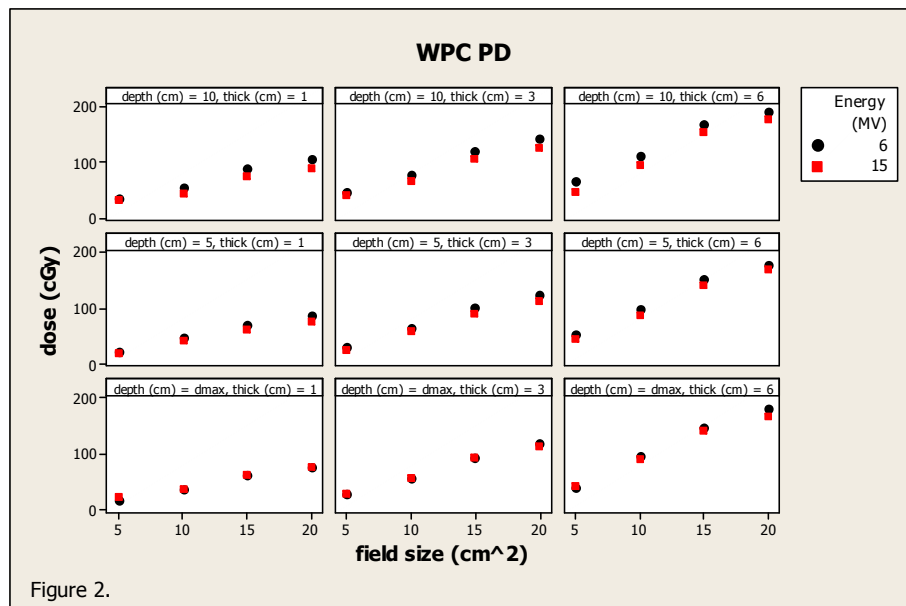


Figure 2.

Figure 2. Peripheral dose of an Elekta SLi equipped with tungsten powder compensators for 6 and 15MV beam energies. Results are normalized to a central axis dose 10Gy. Rows indicate measurements at depths dmax, 5 and 10cm. Columns indicate WPC measurements of thicknesses 1, 3 and 6cm. Peripheral dose increases linearly with field size and is energy dependant only for the largest depth where the peripheral dose becomes greater for 6MV than for 15MV.

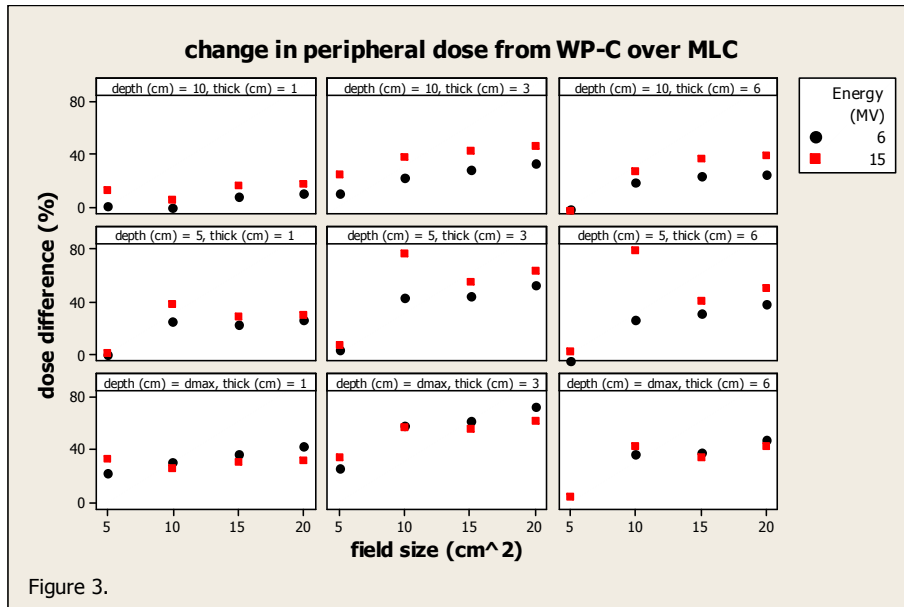


Figure 3.

Figure 3. Change in peripheral dose of an Elekta SLi equipped with tungsten powder compensators over use of a multileaf collimator for 6 and 15MV beam energies. Results are normalized to a central axis dose 10Gy. Rows indicate measurements at depths dmax, 5 and 10cm. Columns indicate measurement thicknesses of 1, 3 and 6cm. In general, the peripheral dose increases with the use of the tungsten powder compensators. However, as treatment depths increase and field size decreases, the peripheral dose of the tungsten powder approaches that of the multileaf collimators until at the smallest field, the compensators show an improvement in out of field dose over multileaf collimation.

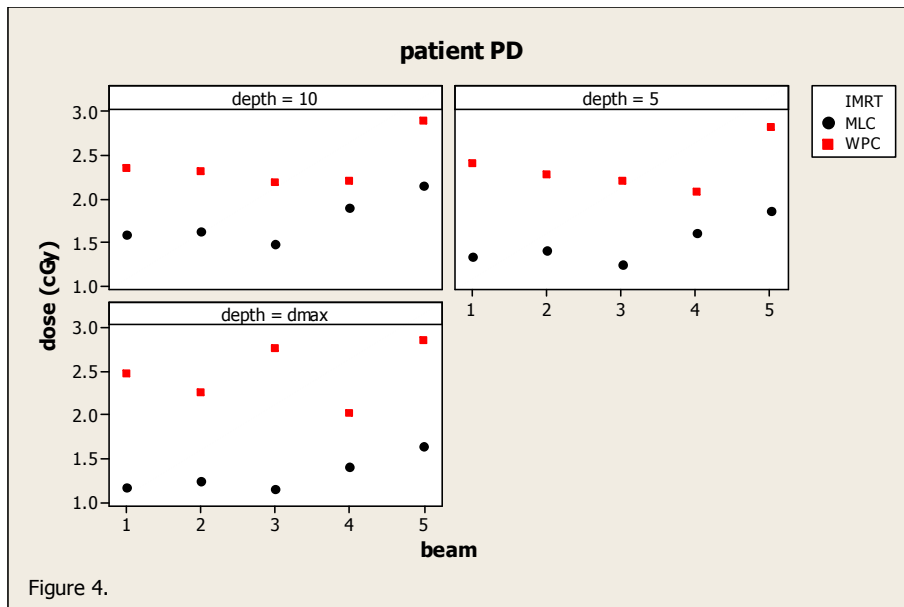


Figure 4.

Figure 4. Comparison of peripheral dose between a 5 beam pelvic plan using multileaf collimation IMRT versus the equivalent plan using tungsten powder compensator based IMRT over a single fraction. Both plans deliver 200cGy/fraction to the prescription point. Beam energy used was 6MV and the peripheral dose was measured 2cm inferior to each of the beam fields as dictated by the compensator plan for depths of dmax, 5 and 10cm. In all cases, the peripheral dose is greater for the compensator plan.