

AbstractID: 9127 Title: Quantitative Comparison Dose Delivery from Conventional Fletcher T&O Applicator and CT/MR Compatible Applicator

**Purpose:** To verify the quantitative variation of dose delivery from conventional T&O applicator and CT/MRI compatible applicator.

**Method and Materials:** The NEUCLETRON conventional T&O applicator (part # 084.400) and CT/MRI compatible T&O applicator (part#189.730) were used to deliver the same prescribed dose to the same spatial points. The systems were set up in free space. A Farmer chamber was placed in five positions around the applicators' radiation area. First four points were 10 cm from OS, 30° spacing, from 0° to 90° against center axis cross plane. The 5<sup>th</sup> point was positioned in "B" point defined in T&O procedure. An X-V film was used to record the isodose distribution of the applicators

**Results:** Dose variations at the first three 10 cm points (0°, 30°, 60° against cross plane) were around agreement of 3%. The point 4, in center axis plane, was right above tandem's tip. The dose variation at this point was 17%. It might be caused by the attenuation difference at the tandems' tip. The dose at "B" point was within 10% different. Because of the geometrical difference of the two sets, the closer points got more difference based on the inverse square law.

**Conclusion:** Compare with conventional Fletcher T&O applicator, the CT/MR compatible applicator delivered more dose for the same plan. The applicator materials might be one of the reasons. The average dose variation at points 10 cm away from the "OS" was around 5%, while the variation for anatomical point "B" was up to 10%. Based on the role of propagation of error, the dose difference of the prescription point "A" would be 10%. If the reference dose prescription is based on the conventional T&O applicator, we have to consider these 10% difference when we do the planning.