AbstractID: 9009 Title: Use of Normoxic Polymer Gel on Dose Verification of 3.1-, 4-, 6-mm Cones for Stereotactic Radiosurgery

Purpose: This study demonstrates the use of normoxic polymer gel on dose verification of 3.1-, 4-, 6- mm cones for stereotactic radiosurgery which is lack of lateral electronic equilibrium.   **Method and Materials:** Two different types of normoxic polymer gel – MAGAT and PAGAT are studied in both larger field (10cmx10cm) and small fields (3.1-, 4-, and 6-mm cones) to obtain percentage depth doses, profiles, and cone factors.   These results were than compared to same measurements using several different small-volume detectors including a small volume ion chamber (PTW23323), a pinpoint chamber (PTW31014), a PTW diamond detector (faced parallel or perpendicular), KODAK XV-film (scanned in 0.1 mm resolution), and even BEAMnrc06Monte Carlo (MC) simulation. **Results:** Preliminary results shows that the dose uncertainty of MAGAT and PAGAT are 7% and 4%, respectively in large field.   The dose uncertainty can be reduced to 3.5 % for MAGAT gel by avoiding the inhomogeneous magnetic field and adding more stirring.   However, the uncertainty of PAGAT cannot be reasonable enhanced due to its bubble problems.   In small fields, the dose deviation between MAGAT gel and MC simulation is about 9%, however, the space deviation between MAGAT and MC is less than 0.4 mm mostly.   These dose deviations can be reduced if avoiding the inhomogeneous magnetic field and adding more stirring **Conclusion:** Compared to MAGAT gel, PAGAT has lower sensitivity (about 1/10 of MAGAT) and often comes with some manufacture problems.   MAGAT shows good agreement in spatial distribution but not so good agreement in dose distribution. This dose deviation can be reduced if avoiding the inhomogeneous magnetic field and adding more stirring.