**AbstractID: 9546 Title: Dosimetric Study of HDR 192Ir and LDR 125I brachytherapy sources using the Penelope Monte Carlo Code**

**Purpose:** To determine the dosimetric parameters of two HDR models 192Ir (microSelectron, and M-19), and LDR 125I brachytherapy sources. **Methods and Materials:** In this study we used the 192Ir microSelectron and M-19 models, and also 125I source (Amersham OncoSeed model 6711). Penelope Monte Carlo transport code was used. All the photonic interactions were taking into account. AAPM TG-43 was followed to determine the dosimetric properties. 2D dose distribution, dose rate constant, anisotropy and radial dose functions were determined. **Results:** For both Iridium models, the 2D-dose distribution agrees very well with published data for radius $1 \leq r \leq 5$ cm, the difference was less than 3%. The dose rate constant is 1.11654 cGy h$^{-1}$ U$^{-1}$ for microSelectron and 1.12456 cGy h$^{-1}$ U$^{-1}$ M-19 model. Less than 3% difference was observed for the radial dose function for radius $1 < r < 5$ cm for both Iridium models. The DRC for 125I was found to be 0.984 cGy h$^{-1}$ U$^{-1}$, and less than 3% difference for the radial dose function in comparison with published data in TG-43. **Conclusion:** Extensive work had been done on 192Ir and 125I brachytherapy sources. Daskalov et al., Medich et al., and Granero et al., used different 192Ir source models and different Monte Carlo transport codes, but the difference for the dosimetric parameters between all these studies was less than 5%. In this study we used Penelope Monte Carlo code to determine the dosimetric parameters. The results showed 3% difference for 2D dose distribution, DRC, and radial dose function for Iridium sources and 3% difference for Iodine source.