

# **East Carolina University®**

## **Department of Physics**

### **Colloquium**

**Friday, November 15th, Room N109, Howell Science Complex  
3:15 p.m. (Refreshments at 3:00 p.m.)**

**Professor Clara Ferreira  
University of Minnesota Medical School**

### **GammaTile Permanent Brain Implants - Dosimetry, Clinical Outcomes, and the Role of Monte Carlo Simulations**

In 2019 the FDA cleared GammaTile (GT) permanent brain implants, in which low-energy brachytherapy seeds can be implanted in the tumor bed immediately after tumor resection. Each GammaTile consists of four Cesium-131 seeds embedded in a collagen tile. GT is currently being used to treat meningiomas, GBM, and brain metastases. A retrospective study of patients treated with GT was conducted at the University of Minnesota. The post-implant dosimetry and clinical outcomes were assessed. Initial institutional data suggests improved local control and overall survival when compared to a similar cohort treated with the standard of care. Randomized clinical trials are currently being conducted to further evaluate treatment outcomes. Additionally, Monte Carlo simulations are being performed to better understand the effects of tissue heterogeneities on the dose delivered to the brain. From our initial results, the accurate dose delivered can be substantially different from the doses calculated by the treatment planning system. These dose differences depended considerably on the medium, i.e. bone, and brain and the distances from the implant. It is of paramount importance to move towards a more accurate clinical dose calculation and towards the clinical implementation of model-based dose calculation algorithms (MBDCA).

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