Optimization of dose gradient for Gamma Knife radiosurgery

**Innovation/Impact:** The ablation of target tissue and sparing of critical normal tissue is the hallmark of stereotactic radiosurgery (SRS). To spare this normal tissue, it is advantageous to have a sharp dose gradient. With the GammaKnife 4C (Elekta AB, Stockholm, Sweden) tools were developed to aid in the selection of a collimator and prescription isodose line for a given target volume. The dosimetric data was evaluated using the newest public version of the treatment planning software, GammaPlan v10.1. This software contains revised physics data based on updated Monte Carlo simulations. One of the tools developed here is a nomogram where the radiosurgeon can look up the target diameter and be provided with the prescription isodose line and collimator for optimal dose gradient. An interactive graph (Figure 1) was also created in Excel (Microsoft Corp. Redmond, Washington) allowing the radiosurgeon to select a target diameter and be provided with collimator, isodose line, and corresponding dose gradient.

![Figure 1: Screenshot of interactive graph that provides prescription isodose line for target diameter and dose gradient.](image-url)