

# Comparison of Two Robotic Systems for the Meningioma Stereotactic Hypofractionated Radiosurgery Planning

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## Abstract

**Objectives:** Aim of the study is to compare and evaluate two CyberKnife treatment planning systems - MultiPlan and Precision, with two different collimators for the meningioma treatment planning.

**Methods:** 15 meningiomas with maximum dimension 3 cm were used to compare two CyberKnife treatment planning systems - MultiPlan [4.6.0] vs. Precision [1.1.1]. In the MultiPlan Planning System, a fixed collimator was used, whereas in the Precision InCise Multileaf Collimator (MLC) was used. The prescribed dose was 16 Gy in a single fraction. Treatment planning was done using the same parameters (dose constraints, auto-shells) for each system. Meningiomas were distant from organs at risk and therefore the comparative criterion was dose in the whole brain ( $V_{12} < 10\text{cc}$ ). It will also be compared estimated treatment time, Conformity Index (CI), number of beams and total MU.

**Results:** Minimum, mean and maximum doses were comparable for both treatment planning systems. For the MultiPlan System treatment time was  $36 \pm 4$  min., there was  $127 \pm 31$  beams, total MU were  $11437 \pm 1093$  MU,  $CI = 1.2 \pm 0.1$  and  $V_{12} = 3.1 \pm 0.8$ . For the Precision System treatment time was  $23 \pm 3$  min., there was  $38 \pm 4$  beams, total MU were  $4033 \pm 808$  MU,  $CI = 1.5 \pm 0.2$  and  $V_{12} = 4.2 \pm 2$ .

**Conclusions:** Treatment time is shorter for the MLC in the Precision treatment planning system, but the dose distribution outside the tumor is better for MultiPlan and fixed collimator. The physician's decision is, which treatment planning strategy is better for an individual patient.

## Open Access

### Abstract

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