

1: *Pediatr Blood Cancer*. 2005 Sep;45(3):304-10.

**Robotically guided radiosurgery for children.**

Giller CA, Berger BD, Pistenmaa DA, Sklar F, Weprin B, Shapiro K, Winick N, Mulne AF, Delp JL, Gillo JP, Gall KP, Dicke KA, Swift D, Sacco D, Harris-Henderson K, Bowers D.

Baylor University Medical Center, HTPN, 8080 N. Central Expressway, Ste. 1650, Dallas, TX 75206, USA.  
ColeG@BaylorHealth.edu

**BACKGROUND:** A robotically guided linear accelerator has recently been developed which provides frameless radiosurgery with high precision. Potential advantages for the pediatric population include the avoidance of the cognitive decline associated with whole brain radiotherapy, the ability to treat young children with thin skulls unsuitable for frame-based methods, and the possible avoidance of general anesthesia. We report our experience with this system (the "Cyberknife") in the treatment of 21 children.

**PROCEDURES:** Cyberknife radiosurgery was performed on 38 occasions for 21 patients, age ranging from 8 months to 16 years (7.0 +/- 5.1 years), with tumors considered unresectable. Three had pilocytic astrocytomas, two had anaplastic astrocytomas, three had ependymomas (two anaplastic), four had medulloblastomas, three had atypical teratoid/rhabdoid tumors, three had craniopharyngiomas, and three had other pathologies. The mean target volume was 10.7 +/- 20 cm<sup>3</sup>, mean marginal dose was 18.8 +/- 8.1 Gy, and mean follow-up is 18 +/- 11 months. Twenty-seven (71%) of the treatments were single-shot and eight (38%) patients did not require general anesthesia.

**RESULTS:** Local control was achieved in the patients with pilocytic and anaplastic astrocytoma, three of the patients with medulloblastoma, and the three with craniopharyngioma, but not for those with ependymoma. Two of the patients with rhabdoid tumors are alive 16 and 35 months after this diagnosis. There have been no procedure related deaths or complications.

**CONCLUSION:** Cyberknife radiosurgery can be used to achieve local control for some children with CNS tumors without the need for rigid head fixation. (c) 2004 Wiley-Liss, Inc.

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