

AbstractID: 6444 Title: Fetal dose estimates for radiotherapy during pregnancy – case report of a young woman with medulloblastoma

**Purpose:** To determine clinically the fetal dose from irradiation of head and neck during pregnancy by a young woman using phantom measurements.

**Method:** A 30 years old woman with medulloblastoma should receive a cranio spinal axis irradiation during pregnancy. Phantom measurements should show if the irradiation of head and neck as a first step of the radiotherapy is possible. Fetal dose was estimated with measurements at an Alderson-phantom using thermoluminescent dosimeters (TLDs). Irradiation of typical fields (26x24 cm<sup>2</sup>, 8x8 cm<sup>2</sup>, 6 MV photons) were simulated, measuring points were used as in the AAPM report no 50. A special shielding was developed to reduce the dose at the foetus.

**Results:** For single doses of 2 Gy the measurements at the phantom results in maximal doses between 6.04 mGy and 1.86 mGy for the large fields (0.95 mGy to 0.39 mGy for the smaller boost fields) at different points between fundus and pubis without any shielding. Using a specially designed shielding the doses were reduced to 3.90 mGy and 1.16 mGy. For a planned total dose for the patient of 30 + 24 Gy the fetal dose should be 0.03 Gy to 0.11 Gy without and 0.02 Gy to 0.07 Gy with the shielding. In vivo measurements during radiotherapy confirmed these values for a single irradiation.

**Conclusion:** Irradiation during pregnancy should be avoided if anyway possible. To reduce the fetal dose a specially designed shielding should be used. Also for irradiation in the region of head and neck in any case measurements should be done to estimate the fetal dose before starting radiotherapy.