

## **Radiation Dose Predicts for Biochemical Control in Intermediate-Risk Prostate Cancer Patients Treated with Low-Dose-Rate Brachytherapy**

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Determining the best treatment for intermediate-risk prostate cancer is difficult, as multiple treatment options exist. Radiation options for prostate cancer include both external beam radiation therapy and brachytherapy. A cohort of patients with intermediate-risk prostate cancer who received brachytherapy as part of their treatment was analyzed. Various patient and treatment factors were analyzed in order to assess their impact on their FFbF (freedom from biochemical failure). The only factor that significantly predicted FFbF was the total radiation dose received. The ability to safely deliver these high doses to the prostate therefore remains an important goal in patients who receive radiation.

## **Safety and Efficacy of Bevacizumab with Hypofractionated Stereotactic Irradiation for Recurrent Malignant Gliomas**

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Bevacizumab was given with hypo-fractionated re-irradiation to patients with recurrent malignant gliomas to test the safety of this combination in brain tumor patients. The combination proved safe and, even more interestingly, the observed 6 month PFS of 65% was extraordinary for this group, suggesting that bevacizumab was acting as a radiosensitizer. In addition, no radiation injury was observed in these re-irradiated patients, who had received a cumulative dose of 90 Gy. This observation has spurred a developing multicenter radiation dose escalation study in recurrent glioma patients receiving concomitant bevacizumab with the idea that this drug is somehow protecting normal brain.

## **Combination of the Pro-apoptotic TRAIL-receptor Antibody Mapatumumab with Ionizing Radiation Strongly Increases Long Term Tumor Control Under Ambient and Hypoxic Conditions**

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Mapatumumab is a human TRAIL-receptor antibody, which specifically induces apoptosis in a wide range of solid and hematopoietic tumor cells. In this study, the combined effect of mapatumumab with ionizing radiation on long-term tumor control was investigated in a colorectal xenograft mouse model. The combination resulted in a striking increase of tumor control rates after e.g. 44.2 Gy from 56% to 92% ( $p = 0.000076$ ) and 30% to 76% ( $p = 0.000069$ ) with mapatumumab under ambient and hypoxic conditions, respectively. Our results indicate that the combination of target specific apoptosis inducers with ionizing radiation may be highly active in solid tumor models and thus comprise a new strategy in radiation oncology.

## **Whole Brain Radiotherapy with Simultaneous Integrated Boost of Multiple Brain Metastases Using Volumetric Modulated Arc Therapy**

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This study evaluated the use of volumetric modulated arc therapy (RapidArc) for generating composite plans of whole brain radiotherapy (20 Gy/5 fractions) with a simultaneously integrated boost (additional 20 Gy/5 fractions) to multiple brain metastases. RapidArc plans could be generated within one hour and showed a mean conformity index of 1.36. Composite RapidArc plans had much steeper dose-gradients outside the brain metastases than plans where WBRT was followed by conventional radiosurgery. The average beam-on time for patient treatments was 180 seconds. Film dosimetry revealed excellent agreement between the calculated and measured doses.