

AbstractID: 2678 Title: Monte Carlo calculation of the TG-43 dosimetric parameters of a new BEBIG Ir-192 HDR source

Purpose: High dose rate (HDR) brachytherapy is a highly extended practice in clinical brachytherapy today. Quality dose rate distribution datasets of the HDR sources used in a clinical treatment are required. Because of the different source designs, a specific dosimetry dataset is required for each source model. In the recently published BRAPHYQS-ESTRO Report, an overview of available dosimetric data for all HDR Ir-192 sources is given, pointing out the lack of data for one of the sources, the used by the BEBIG MultiSource afterloading system (BEBIG GmbH, Germany). The purpose of this study is to obtain detailed dose rate distributions in liquid water media around this source.

Material and methods: The MC code GEANT4 was used to estimate dose rate in water and air-kerma strength around the Ir-192 source. All the details of the stainless steel encapsulated BEBIG HDR 1.1 mm in external diameter has been included in the simulation.

Results: A complete dosimetric dataset for the BEBIG Ir-192 HDR source is presented. TG43 dosimetric functions and parameters have been obtained as well as a 2-D rectangular dose rate table, consistent with the TG43 dose calculation formalism.

Conclusions: The dosimetric parameters and functions obtained for the BEBIG HDR source have been compared with that obtained in the literature for others HDR sources, showing that the use of specific datasets for this new source is justified. This dataset can be used as input in the TPS and to validate its calculations. As policy of BRAPHYQS-ESTRO task group, this dataset will be incorporated to the website: <http://www.uv.es/braphyqs> available to users in excel format.