

**Purpose:** The use of high dose rate brachytherapy (HDR) is a highly extended practice today, being the Ir-192 the most widely extended isotope used for this type of practice although Co-60 is also available for HDR. The purpose of this study is to obtain the dosimetric parameters of the Co-60 source used by the BEBIG MultiSource remote afterloader (BEBIG GmbH, Germany) for which there is no dosimetric data available in the literature. It is recommended that accurate dose distribution data, based on a realistic geometry and on the mechanical characteristics of the source, should be obtained by an appropriate method, experimental or Monte Carlo, to be used as input in the HDR Treatment Planning System.

**Material and Methods:** The Monte Carlo code GEANT4 has been used to obtain the TG43 parameters and the 2-D rectangular dose rate table of the BEBIG Co-60 HDR source.

**Results:** The dose rate constant, radial dose function and anisotropy function have been calculated and are presented in tabular form as well as a detailed 2-D rectangular dose rate table to check the treatment planning systems calculations.

**Conclusions:** A Monte Carlo dosimetric study of the BEBIG  $^{60}\text{Co}$  HDR source for which no published dosimetric data exists has been done. These dosimetric datasets can be used as input and/or to validate the TPS calculations.