ICRU GEC ESTRO report on image guide adaptive brachytherapy in cancer of the cervix (IGABT)

SP-0625

B. Pötter1, C. Kirisits1
1Medizinische Universität Wien, Radiation Oncology, Vienna, Austria

The new joint ICRU/GEC ESTRO report (88, 2013) reflects and further structures the on-going developments in the field of IGABT and was preceded by A GEC ESTRO recommendation on adaptive target concepts, dose-volume parameters, biological modelling, applicator reconstruction and imaging. They have become widely accepted in the international community and have become the basis of this report. The current report focuses on the volumetric image guided adaptive approach. It also includes traditional 2D planning which is linked to the 3D world by recommending point A. The GTV and CTV concepts follow the ICRU tradition with a special focus on the change of CTV during treatment. The High Risk CTV is introduced which represents residual GTV and surrounding are assumed to carry a high risk for residual cancer cells after 40-45 Gy EBRT plus chemotherapy and always the whole cervix. An additional Intermediate Risk CTV is suggested representing the area of tumour spread at diagnosis and a margin around the CTVHR. Uncertainties for GTV/CTV selection and contouring are recognized as due to internal motion and applicator reconstruction and discussed in the frame of intracavitary brachytherapy. The addition of margins (as in EBRT) is discouraged (dose escalation). PTV has to be designed when planning the application which has to be adapted as appropriate. For adjacent OARs rectum, bladder and sigmoid 2 cm³ and 0.1 cm³ are defined as reference. For the vagina anatomical reference points are recommended due to contouring and dosimetric uncertainties. Uncertainties due to internal motion are recognized for OARs and corrected through repetitive imaging. For normal tissues 2D cm³ and 0.01 cm³ are the main parameters for the 3D approach. Additional parameters for the mid and low dose region are discussed, mainly reflecting EBRT. Applicator related points are recommended for the upper vagina (at 0/5 mm (ABS)) and anatomy related points for the mid and low vagina. For the 2D approach the dose points for rectum and bladder remain as defined in ICRU 38.

The report also contains recommendations and information on treatment planning, applicator reconstruction, 3D dose summation, source strength specification and dose calculation. “Planning aim” (ICRU 83) is also introduced for brachytherapy treatment planning and represents a certain “treatment schedule” for a specific clinical scenario including a set of dose and volume parameters for specific applicator. During the treatment planning optimization, adaptations are performed according to dose volume constraints for the target and OARs. “Prescription” is based on the final set of parameters which presents the treatment plan finally used for irradiation.

The upcoming report is based on concepts and terms developed within the frame of the on-going technical and clinical developments. The terms support the transition from 2D to 3D/4D gynaecologic brachytherapy and have become integrated into the educational programmes of leading international Societies. They are being clinically validated in a spreading number of centres in Europe and worldwide. Research validation is on-going within various multi-centre trials (e.g. EMBRACE) which will help to define the “true” clinical value, reliability and reproducibility. These evaluations may require further adaptations.