INSTRUCTIONS FOR USE

for

Microsoft (®) Excel spread sheet "LQ spread sheet_v2.1"

The Microsoft (®) Excel spread sheet "LQ spread sheet_v2.1" is designed for calculating BED (Biologically Effective Dose) and equivalent (isoeffective) dose in 2 Gy fractions (D_{IsoE} = EQD_2). It is intended that the data is entered into the blue fields.

The section "treatment planning" enables to set a total EQD_2 isoeffective dose of external beam therapy plus brachytherapy and the number of remaining brachytherapy fractions. The physical dose per remaining brachytherapy fraction is than calculated, in order to come up with the specified isoeffective total dose. This tool can be used to set a EQD_2-dose constraint (CTV-min or OAR-max) for the whole treatment. The corresponding physical dose constraint per remaining brachytherapy fraction is than calculated.

Recommended tissue parameters are α/β = 10 Gy for tumour and target structures of cervical cancer, α/β = 3 Gy for late effects of the organs at risk bladder, rectum and sigmoid colon and $T_{1/2}$ = 1.5 h for tumour and target structures as well as organs at risk ($T_{1/2}$ is not relevant for external beam therapy and HDR brachytherapy).

The spread sheets work based on the linear-quadratic model for incomplete monoexponential sublethal cell damage repair (LQ model). If you want to see the formulas just mark the whole sheet. Please be aware that only repair due to different fractionation and dose rate schedules is taken into account, the effects of repopulation, reoxygenation, redistribution and dose and dose rate heterogeneity are ignored.

We emphasise that these spread sheet is an in-house developed research tool and we ask you to handle the results with care. Neither the authors nor anybody else can accept any legal responsibility or liability for any errors or omissions that may be made. In particular (but without limiting the generality of the preceding disclaimer) effort has been made to check the calculation process; however, it is still possible that errors have been missed.