Supplementary Table S2: Selected dosimetric parameters related to various organs at risk (OAR). Doses D_x are expressed in Gy (RBE), integral dose (ID) is expressed in cm^3 x Gy (RBE) and volumes in % or cm^3 of the structure volume. V_x: volume of the OAR receiving a minimum dose of x Gy (RBE), Dx: minimum dose received in x % of the OAR, $D_{0.03\ cm^3}$: minimum dose received in 0.03 cm^3 of the OAR and D_{mean}: mean dose received by the OAR. CTV: clinical target volume; CL: contralateral; IL: ipsilateral, SD: standard deviation; Δabs: absolute difference; Δrel: relative difference in %.

		Helium			Proton			Δ_{abs}(Helium - Proton)			Δ_{rel}(Helium - Proton)			
		Mean	±	SD	Mean	±	SD	Mean	±	SD	Mean	±	SD	p-value
Brain	$D_{0.03cm^3}$	45.5	±	0.6	46.0	±	0.7	-0.5	±	0.4	-1.0	±	0.8	0.003
	$D_{2\%}$	29.1	±	12.8	31.9	±	11.1	-2.9	±	2.5	-12.0	±	11.0	0.007
	D_{mean}	2.4	±	1.2	3.2	±	1.5	-0.8	±	0.6	-25.7	±	9.7	0.001
	$V_{20}(cm^3)$	61.1	±	40.7	86.0	±	54.5	-24.9	±	16.7	-29.2	±	8.7	0.001
	$V_{20}(\%)$	3.6	±	2.1	5.1	±	2.9	-1.5	±	1.0				
	ID	3933.1	±	2132.4	5270.4	±	2650.1	-1337.3	±	894.5				
Brain (without CTV)	$D_{0.03cm^3}$	45.1	±	0.8	45.4	±	0.9	-0.3	±	0.4	-0.6	±	0.9	0.039
	$D_{2\%}$	26.1	±	10.7	29.5	±	9.5	-3.4	±	2.2	-14.1	±	10.3	0.001
	$D_{50\%}$	0.1	±	0.1	0.1	±	0.1	0.0	±	0.1	-	±	-	0.231
	D_{mean}	2.2	±	1.1	2.9	±	1.4	-0.8	±	0.5	-26.5	±	9.5	0.001
	$V_{10}(cm^3)$	111.9	±	61.9	181.9	±	107.1	-70.0	±	63.3	-35.1	±	16.2	0.001
	$V_{15}(cm^3)$	72.6	±	42.4	114.9	±	66.3	-42.3	±	33.4	-34.6	±	13.8	0.001
	$V_{20}(cm^3)$	50.4	±	30.0	75.8	±	44.7	-25.4	±	17.2	-32.5	±	9.4	0.001
	$V_{35}(cm^3)$	22.3	±	17.0	27.5	±	19.5	-5.2	±	4.6	-21.1	±	9.4	0.001
	$V_{10}(\%)$	6.8	±	3.6	11.1	±	6.5	-4.3	±	3.9				
	$V_{15}(\%)$	4.4	±	2.3	7.0	±	3.8	-2.6	±	2.0				
	$V_{20}(\%)$	3.0	±	1.6	4.6	±	2.5	-1.5	±	1.0				
	$V_{35}(\%)$	1.3	±	0.9	1.7	±	1.2	-0.3	±	0.3				
	ID	3538.1	±	1815.5	4812.2	±	2337.4	-1274.1	±	828.4				
Brain supratentorial	$D_{0.03cm^3}$	45.5	±	0.5	46.0	±	0.6	-0.6	±	0.4	-1.1	±	0.8	0.003
	$D_{2\%}$	29.4	±	12.9	32.0	±	11.2	-2.6	±	2.6	-10.9	±	10.5	0.014
	$D_{50\%}$	0.1	±	0.1	0.1	±	0.1	0.0	±	0.1	-	±	-	0.410
	D_{mean}	2.4	±	1.2	3.3	±	1.6	-0.9	±	0.8	-25.7	±	1.8	0.001
	$V_{10}(cm^3)$	110.7	±	66.5	172.3	±	105.3	-61.6	±	57.9	-32.8	±	14.0	0.001
	$V_{15}(cm^3)$	73.7	±	47.2	109.9	±	67.1	-36.2	±	30.0	-31.5	±	8.0	0.001
	$V_{20}(cm^3)$	53.1	±	34.9	74.0	±	47.8	-20.9	±	14.8	-27.9	±	16.8	0.001
	$V_{10}(\%)$	7.8	±	4.4	12.2	±	7.3	-4.4	±	4.2				
	$V_{15}(\%)$	5.1	±	2.8	7.7	±	4.3	-2.6	±	2.1				
	$V_{20}(\%)$	3.7	±	2.1	5.1	±	2.9	-1.5	±	1.0				
	ID	3409.0	±	1839.4	4619.1	±	2391.3	-1210.1	±	924.3				
Brain infratentorial	$D_{0.03cm^3}$	43.0	±	6.5	43.3	±	6.5	-0.4	±	0.6	-0.8	±	4.9	0.067
	$D_{2\%}$	26.4	±	14.1	30.6	±	12.2	-4.3	±	3.3	-18.6	±	20.3	0.002
	$D_{50\%}$	0.1	±	0.1	0.1	±	0.0	0.1	±	0.1	-	±	-	0.008
	D_{mean}	1.9	±	1.1	2.6	±	1.4	-0.8	±	0.5	-29.5	±	8.9	0.001
	$V_{10}(cm^3)$	13.4	±	8.4	20.1	±	10.5	-6.6	±	3.6	-36.0	±	6.3	0.001
	$V_{15}(cm^3)$	10.5	±	7.3	15.4	±	9.1	-4.9	±	3.0	-35.0	±	12.2	0.001

	$V_{20}(cm^3)$	8.4	±	6.4	12.1	±	7.8	-3.7	±	2.6	-33.4	±	21.7	0.001
	$V_{10}(\%)$	5.3	±	3.2	8.0	±	4.4	-2.7	±	1.6				
	$V_{15}(\%)$	4.2	±	2.8	6.2	±	3.8	-2.0	±	1.3				
	$V_{20}(\%)$	3.3	±	2.5	4.8	±	3.3	-1.5	±	1.1				
	ID	472.0	±	289.0	657.0	±	343.2	-185.0	±	102.5				
Cerebellum	$D_{0.03cm^3}$	6.7	±	7.4	12.6	±	10.7	-5.9	±	5.4	-52.5	±	23.1	0.001
	$D_{2\%}$	1.2	±	1.1	2.8	±	2.8	-1.7	±	1.9	-54.0	±	15.7	0.001
	$D_{50\%}$	0.1	±	0.1	0.0	±	0.0	0.1	±	0.1	-	±	-	0.001
	D_{mean}	0.2	±	0.1	0.3	±	0.2	-0.1	±	0.1	-14.9	±	42.6	0.046
	$V_{10}(cm^3)$	0.1	±	0.2	0.5	±	0.8	-0.4	±	0.7	-39.1	±	39.4	0.031
	$V_{15}(cm^3)$	0.0	±	0.1	0.2	±	0.4	-0.2	±	0.3	-29.1	±	42.0	0.125
	$V_{20}(cm^3)$	0.0	±	0.0	0.1	±	0.2	-0.1	±	0.2	-23.6	±	40.6	0.250
	$V_{10}(\%)$	0.1	±	0.1	0.3	±	0.6	-0.3	±	0.5				
	$V_{15}(\%)$	0.0	±	0.0	0.1	±	0.3	-0.1	±	0.2				
	$V_{20}(\%)$	0.0	±	0.0	0.1	±	0.1	-0.1	±	0.1				
	ID	28.3	±	19.8	40.3	±	31.5	-12.0	±	18.5				
Cerebellum anterior	$D_{0.03cm^3}$	3.6	±	4.5	8.5	±	9.1	-5.0	±	4.9	-56.8	±	17.8	0.001
	$D_{2\%}$	1.3	±	1.5	3.4	±	4.1	-2.1	±	2.6	-54.8	±	19.9	0.001
	$D_{50\%}$	0.1	±	0.1	0.1	±	0.1	0.0	±	0.1	-	±	-	0.082
	D_{mean}	0.2	±	0.2	0.4	±	0.4	-0.2	±	0.3	-17.2	±	44.2	0.041
	$V_{10}(cm^3)$	0.0	±	0.0	0.1	±	0.1	-0.1	±	0.1	-40.5	±	46.7	0.063
	$V_{15}(cm^3)$	0.0	±	0.0	0.0	±	0.1	0.0	±	0.1	-23.5	±	40.5	0.250
	$V_{20}(cm^3)$	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	-16.8	±	37.5	0.500
	$V_{10}(\%)$	0.1	±	0.2	0.5	±	1.1	-0.4	±	0.9				
	$V_{15}(\%)$	0.0	±	0.1	0.2	±	0.5	-0.2	±	0.5				
	$V_{20}(\%)$	0.0	±	0.0	0.1	±	0.3	-0.1	±	0.3				
	ID	3.7	±	2.2	5.9	±	5.1	-2.2	±	3.4				
Cerebellum posterior	$D_{0.03cm^3}$	6.2	±	7.4	11.1	±	9.6	-4.9	±	4.3	-51.3	±	23.8	0.002
	$D_{2\%}$	1.2	±	1.2	2.8	±	3.0	-1.6	±	1.9	-52.6	±	16.3	0.001
	$D_{50\%}$	0.1	±	0.1	0.0	±	0.0	0.1	±	0.1	-	±	-	0.001
	D_{mean}	0.2	±	0.1	0.3	±	0.2	-0.1	±	0.1	-11.9	±	45.5	0.079
	$V_{10}(cm^3)$	0.1	±	0.2	0.4	±	0.8	-0.3	±	0.6	-35.1	±	41.7	0.063
	$V_{15}(cm^3)$	0.0	±	0.1	0.2	±	0.4	-0.1	±	0.3	-37.9	±	40.7	0.125
	$V_{20}(cm^3)$	0.0	±	0.0	0.1	±	0.2	-0.1	±	0.2	-19.1	±	34.2	0.250
	$V_{10}(\%)$	0.1	±	0.1	0.3	±	0.7	-0.2	±	0.5				
	$V_{15}(\%)$	0.0	±	0.0	0.1	±	0.3	-0.1	±	0.3				
	$V_{20}(\%)$	0.0	±	0.0	0.1	±	0.1	0.0	±	0.1				
	ID	24.6	±	18.1	34.3	±	28.5	-9.7	±	16.4				
Brainstem	$D_{0.03cm^3}$	32.9	±	10.3	35.8	±	8.7	-2.9	±	2.7	-9.6	±	9.9	0.002
	$D_{2\%}$	25.2	±	13.1	30.0	±	11.1	-4.9	±	3.3	-20.6	±	17.2	0.001
	D_{mean}	4.8	±	3.9	7.7	±	4.8	-2.9	±	1.7	-41.7	±	15.2	0.001
	ID	134.4	±	108.7	213.5	±	137.1	-79.1	±	50.4				
Hippocampus bilateral	$D_{0.03cm^3}$	20.9	±	13.0	28.8	±	11.6	-7.9	±	4.5	-32.7	±	17.8	0.001
	$D_{2\%}$	17.8	±	12.5	26.3	±	11.7	-8.5	±	4.7	-38.4	±	19.1	0.001
	$D_{40\%}$	1.6	±	3.1	4.0	±	5.3	-2.4	±	2.7	-65.7	±	14.7	0.001
	$D_{50\%}$	0.8	±	1.6	2.2	±	3.5	-1.3	±	2.0	-58.9	±	18.3	0.001

	D_{mean}	2.8	±	2.7	5.6	±	3.9	-2.8	±	1.8	-54.1	±	14.4	0.001
	ID	11.4	±	10.0	23.1	±	14.5	-11.6	±	7.6				
Hippocampus CL	$D_{0.03cm^3}$	12.5	±	13.9	18.7	±	15.4	-6.2	±	4.2	-50.3	±	25.7	0.001
	$D_{2\%}$	11.7	±	13.2	17.7	±	15.0	-6.1	±	4.6	-51.9	±	26.5	0.002
	$D_{50\%}$	0.5	±	0.8	1.4	±	2.2	-0.9	±	1.5	-50.3	±	31.2	0.003
	D_{mean}	1.8	±	2.2	3.7	±	3.9	-1.9	±	2.1	-57.9	±	15.8	0.001
	ID	3.7	±	4.4	7.3	±	7.2	-3.7	±	3.9				
Hippocampus IL	$D_{0.03cm^3}$	19.9	±	13.6	27.9	±	12.1	-8.0	±	5.0	-35.2	±	20.4	0.001
	$D_{2\%}$	18.9	±	13.4	27.3	±	12.2	-8.3	±	5.2	-37.0	±	20.3	0.001
	$D_{50\%}$	2.0	±	3.4	5.1	±	6.0	-3.2	±	3.1	-62.5	±	18.4	0.001
	D_{mean}	3.9	±	3.5	7.7	±	4.9	-3.8	±	2.4	-53.1	±	14.8	0.001
	ID	7.8	±	6.2	15.7	±	9.3	-8.0	±	5.2				
Pituitary	$D_{0.03cm^3}$	39.2	±	8.1	41.1	±	6.5	-1.8	±	2.2	-5.2	±	7.6	0.001
	$D_{2\%}$	40.1	±	7.2	42.0	±	5.6	-2.0	±	2.2	-5.2	±	7.0	0.001
	D_{mean}	36.3	±	11.4	37.9	±	10.1	-1.7	±	1.7	-6.1	±	8.8	0.003
	ID	14.6	±	7.3	15.3	±	7.2	-0.7	±	0.6				
Chiasma	$D_{0.03cm^3}$	36.5	±	12.3	37.6	±	11.0	-1.1	±	1.4	-5.3	±	9.0	0.007
	$D_{2\%}$	37.3	±	10.5	37.8	±	10.0	-0.6	±	1.1	-2.3	±	4.0	0.102
	D_{mean}	25.2	±	15.0	27.0	±	14.2	-1.7	±	2.1	-11.5	±	12.7	0.024
	ID	38.7	±	26.6	41.8	±	28.2	-3.1	±	5.1				
Optic nerve CL	$D_{0.03cm^3}$	36.3	±	10.8	36.9	±	10.4	-0.6	±	1.2	-2.2	±	4.5	0.102
	$D_{2\%}$	36.7	±	10.3	37.2	±	9.9	-0.6	±	1.1	-2.1	±	3.8	0.123
	D_{mean}	26.2	±	13.3	27.8	±	12.3	-1.6	±	2.0	-9.2	±	12.2	0.010
	ID	30.6	±	33.0	31.8	±	32.1	-1.2	±	1.9				
Optic nerve IL	$D_{0.03cm^3}$	41.8	±	2.7	41.9	±	2.9	-0.2	±	0.6	-0.4	±	1.5	0.377
	$D_{2\%}$	42.1	±	2.4	42.3	±	2.7	-0.3	±	0.6	-0.6	±	1.5	0.148
	D_{mean}	34.4	±	9.0	35.4	±	8.0	-1.0	±	1.2	-3.6	±	4.6	0.054
	ID	35.1	±	28.0	35.8	±	27.2	-0.7	±	1.1				
Eye CL	$D_{0.03cm^3}$	14.2	±	10.5	19.1	±	9.0	-4.9	±	4.1	-32.0	±	29.8	0.001
	$D_{2\%}$	12.0	±	9.5	16.4	±	8.3	-4.4	±	3.1	-34.5	±	29.0	0.001
	D_{mean}	4.0	±	3.6	6.1	±	4.3	-2.1	±	1.6	-43.0	±	25.4	0.001
	$V_{10}(cm^3)$	1.0	±	1.5	1.8	±	2.2	-0.8	±	0.9	-66.7	±	31.4	0.001
	$V_{10}(\%)$	11.1	±	15.6	19.1	±	23.4	-8.0	±	9.8				
	ID	36.9	±	33.5	56.4	±	41.3	-19.5	±	15.6				
Eye IL	$D_{0.03cm^3}$	26.9	±	12.4	28.6	±	11.3	-1.6	±	3.5	-8.3	±	17.3	0.123
	$D_{2\%}$	24.2	±	12.6	25.8	±	11.4	-1.6	±	3.1	-10.2	±	17.9	0.102
	D_{mean}	9.4	±	6.8	11.1	±	7.2	-1.8	±	1.3	-22.3	±	17.9	0.001
	$V_{10}(cm^3)$	3.3	±	2.7	4.0	±	2.9	-0.7	±	0.5	-35.5	±	34.8	0.001
	$V_{10}(\%)$	36.6	±	28.5	43.1	±	30.2	-7.5	±	5.9				
	ID	87.2	±	65.0	103.4	±	69.4	-16.2	±	12.0				
Lens CL	$D_{0.03cm^3}$	2.3	±	2.1	4.2	±	3.6	-1.9	±	2.2	-47.6	±	25.1	0.001
	$D_{2\%}$	3.0	±	3.0	5.1	±	4.4	-2.1	±	2.5	-45.4	±	26.8	0.001
	D_{mean}	1.7	±	1.8	3.2	±	2.8	-1.5	±	1.8	-47.9	±	27.7	0.001
	ID	0.3	±	0.3	0.7	±	0.6	-0.3	±	0.4				
Lens IL	$D_{0.03cm^3}$	4.9	±	5.8	6.8	±	7.3	-0.1	±	1.9	-37.5	±	20.2	0.001
	$D_{2\%}$	6.0	±	6.9	8.0	±	8.3	-2.1	±	1.9	-34.5	±	21.5	0.003

	D_{mean}	3.6	±	4.2	5.3	±	5.3	-1.6	±	1.5	-39.8	±	18.8	0.001
	ID	0.8	±	1.0	1.1	±	1.4	-0.4	±	0.4				
Lacrimal gland CL	$D_{0.03cm^3}$	3.6	±	4.0	5.5	±	4.8	-1.9	±	1.8	-41.6	±	28.5	0.001
	$D_{2\%}$	3.8	±	4.2	5.8	±	4.7	-2.0	±	1.9	-42.3	±	28.7	0.005
	D_{mean}	1.8	±	2.3	3.0	±	3.6	-1.2	±	1.7	-40.1	±	37.5	0.007
	ID	1.9	±	3.0	3.3	±	5.5	-1.4	±	2.6				
Lacrimal gland IL	$D_{0.03cm^3}$	10.1	±	8.9	13.2	±	10.4	-3.1	±	2.7	-28.2	±	18.3	0.001
	$D_{2\%}$	10.8	±	9.3	14.0	±	10.8	-3.1	±	2.8	-26.9	±	18.0	0.001
	D_{mean}	5.2	±	4.9	7.1	±	6.3	-1.9	±	1.8	-31.3	±	16.8	0.001
	ID	4.5	±	5.3	6.3	±	7.3	-1.8	±	2.1				
Cochlea CL	$D_{0.03cm^3}$	4.9	±	6.1	8.1	±	6.7	-3.3	±	2.6	-52.6	±	24.1	0.002
	$D_{2\%}$	5.8	±	6.7	9.5	±	7.1	-3.7	±	3.0	-49.3	±	24.5	0.002
	D_{mean}	4.1	±	5.4	7.3	±	6.1	-3.1	±	2.5	-55.3	±	23.5	0.002
	ID	0.5	±	0.7	0.9	±	0.8	-0.4	±	0.3				
Cochlea IL	$D_{0.03cm^3}$	17.1	±	12.0	22.7	±	13.7	-5.6	±	4.5	-29.5	±	17.2	0.001
	$D_{2\%}$	22.5	±	13.8	26.5	±	13.6	-4.0	±	2.6	-20.4	±	17.7	0.001
	D_{mean}	14.7	±	10.3	20.7	±	12.4	-5.9	±	4.3	-32.9	±	16.5	0.001
	ID	2.1	±	2.2	2.8	±	2.6	-0.8	±	0.7				
Parotis CL	$D_{0.03cm^3}$	11.3	±	5.5	16.0	±	6.4	-4.7	±	3.8	-29.5	±	18.0	0.002
	$D_{2\%}$	9.5	±	4.7	13.9	±	5.8	-4.5	±	4.0	-31.4	±	20.8	0.005
	D_{mean}	3.9	±	3.6	6.8	±	4.1	-2.8	±	2.2	-45.4	±	23.6	0.002
	ID	74.7	±	74.9	125.1	±	93.7	-50.4	±	45.3				
Parotis IL	$D_{0.03cm^3}$	23.1	±	13.1	26.9	±	11.9	-3.8	±	2.8	-17.9	±	13.3	0.001
	$D_{2\%}$	20.2	±	13.4	23.2	±	12.2	-3.0	±	2.6	-17.3	±	14.4	0.005
	D_{mean}	8.1	±	7.9	10.6	±	8.9	-2.5	±	1.8	-31.4	±	15.7	0.001
	ID	120.5	±	109.8	159.4	±	122.8	-38.9	±	25.9				
Skin	$D_{0.03cm^3}$	32.2	±	10.7	34.0	±	9.3	-1.8	±	2.4	-6.7	±	9.0	0.019
	$D_{2\%}$	16.2	±	6.6	20.3	±	6.9	-4.1	±	1.9	-21.2	±	8.0	0.001
	$D_{5\%}$	10.4	±	5.0	13.8	±	5.2	-3.4	±	0.8	-27.2	±	8.5	0.001
	D_{mean}	1.6	±	0.9	2.2	±	1.1	-0.7	±	0.2	-20.1	±	27.2	0.001
	$V_{10}(cm^3)$	32.4	±	27.9	49.4	±	30.9	-17.0	±	5.8	-31.2	±	6.3	0.001
	$V_{15}(cm^3)$	15.3	±	15.7	27.5	±	26.5	-12.2	±	11.9	-41.0	±	15.4	0.001
	$V_{20}(cm^3)$	7.6	±	8.5	13.2	±	12.7	-5.6	±	5.0	-51.7	±	21.6	0.002
	$V_{35}(cm^3)$	1.1	±	2.1	1.6	±	3.1	-0.5	±	0.9	-49.5	±	25.2	0.063
	ID	876.4	±	51.5.5	1235.5	±	624.1	-359.1	±	118.2				