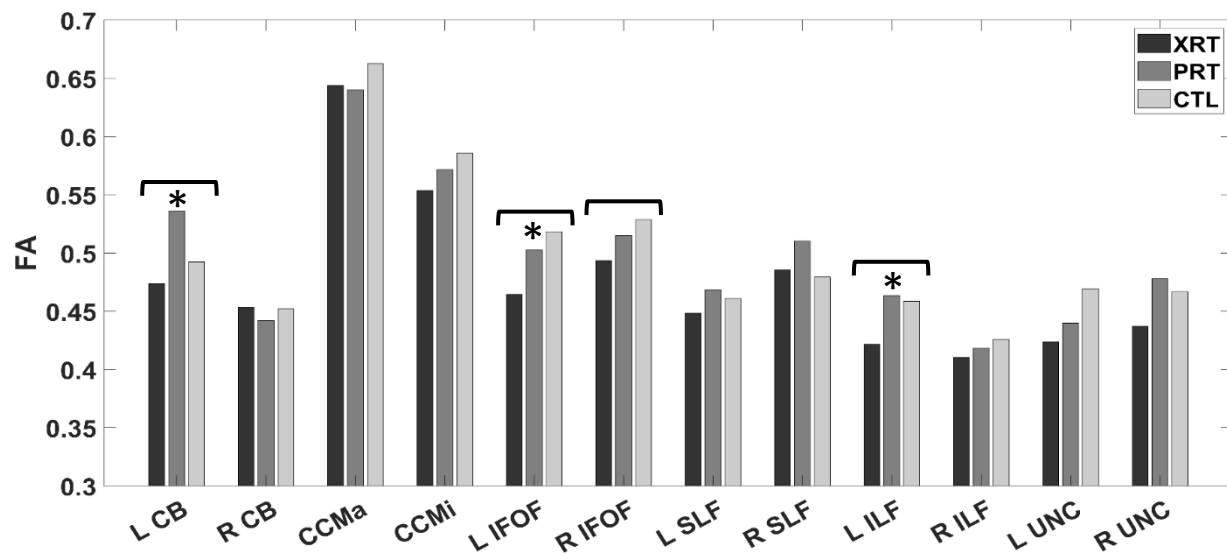


**Figure S1.** Color-coded tracts of interest are shown for a 12-year-old male participant in the control group. Cingulum bundle (CB); Corpus callosum major forceps (CCMa); Corpus callosum minor forceps (CCMi); Inferior fronto-occipital fasciculus (IFOF); Inferior longitudinal fasciculus (ILF); Superior longitudinal fasciculus (SLF); Uncinate fasciculus (UNC)



**Figure S2.** Unadjusted FA group means are shown for each tract for focal radiotherapy patients only. Group differences were determined by ANCOVA with age and handedness as covariates, with  $\alpha = .05$ . Significant omnibus group differences (XRT-PRT-CTL) are depicted by brackets. Significant XRT-PRT differences are depicted by \*.

**Table S1. Tumor Types and Locations for XRT and PRT Patients**

Patient ID	Group	Tumor Type	Primary Site	Other Tumor Sites	Laterality
PRT01	PRT	Medulloblastoma	4 <sup>th</sup> ventricle, arises from vermis	---	---
PRT02	PRT	Medulloblastoma	Posterior fossa	Extension through foramen of Luschka	---
PRT03	PRT	Medulloblastoma	Cerebellum	Extension into right cerebellopontine angle cistern; Extends along right cisternal nerves 7 and 8 within cerebellopontine angle	---
PRT04	PRT	Pilocytic astrocytoma	Left thalamus	---	Left
PRT05	PRT	Anaplastic ependymoma	Frontal lobe	---	Left
PRT06	PRT	Pilomyxoid astrocytoma (Grade II)	Hypothalamus/suprasellar	Extension into 3 <sup>rd</sup> ventricle	---
PRT07	PRT	Pilocytic astrocytoma	4 <sup>th</sup> ventricle	Cystic component left of midline; Left middle cerebellar peduncle	---
PRT08*	PRT	Medulloblastoma	Posterior fossa	---	---
PRT09	PRT	Craniopharyngioma	Hypothalamus/suprasellar	Impinging on 3 <sup>rd</sup> ventricle	---
PRT10	PRT	Pilocytic astrocytoma	Hypothalamus/suprasellar	Extends into 3 <sup>rd</sup> ventricle	---
PRT11	PRT	Desmoplastic ganglioglioma	Left basal ganglia; Left cerebral hemisphere	Extends into insula and left frontal and temporal lobes	Left
PRT12	PRT	Anaplastic ependymoma	Anterior vermis	Cystic loculation in left cerebellar medullary angle; Extends into 4 <sup>th</sup> ventricle; Growth into bilateral foramina Luschka and through foramen of Magendie; Extends along posterior aspect of cervical medullary junction to level of posterior C1 canal; Extension into left cerebellar medullary angle	---
XRT01*	XRT	Pilocytic astrocytoma	Cerebellum; Brainstem/pons	---	---
XRT02	XRT	Medulloblastoma	4 <sup>th</sup> ventricle	Extension into aqueduct;	---

				Extension into cerebello-medullary angle through left foramen of Luschka	
XRT03	XRT	Choroid plexus carcinoma	Posterior horn of the right lateral ventricle	---	Right
XRT04*	XRT	Pilocytic astrocytoma	Hypothalamus/suprasellar	---	---
XRT05	XRT	Medulloblastoma	Posterior fossa anterior to vermis; filling 4 <sup>th</sup> ventricle	Extension down through the plane with tonsils at the level of the obex; Partial extension into left foramen of Luschka.	---
XRT06	XRT	Atypical choroid plexus tumor	Posterior fossa; Cerebellar pontine angle cistern; Foramen of Luschka	Extends through foramen magnum	---
XRT07	XRT	Primitive neuroectodermal tumor- Not otherwise specified	Frontal lobe	---	Left
XRT08	XRT	Anaplastic ependymoma	Posterior fossa	Extension of tumor to C3-C4	---
XRT09	XRT	Medulloblastoma	4 <sup>th</sup> ventricle	Extension into foramen of Magendie; Extension behind medulla and upper spinal cord; Extension into upper spinal canal	---
XRT10	XRT	High grade neoplasm with small blue cell features	Frontal lobe; Temporal lobe; Hypothalamus/suprasellar	---	Right

<sup>1</sup>Tumor locations are based on each patient's first MRI report prior to surgical resection. Three patients (denoted by \*) had this MRI at an outside hospital. Outside MRI records were reviewed by a neuro-oncologist who determined tumor location.

**Table S2. Results of Linear Mixed Models: Focal Radiotherapy Patients Only**

	<b>XRT (<i>n</i> = 5) vs. PRT (<i>n</i> = 8)</b>			<b>PRT (<i>n</i> = 8) vs. CTL (<i>n</i> = 23)</b>		
	<i>β</i>	<i>t</i>	<i>p</i>	<i>β</i>	<i>t</i>	<i>p</i>
FA	-0.034	-2.47	<b>.014</b>	0.007	.706	.480
AD	-0.023	-0.87	.380	-0.009	-0.52	.603
RD	0.036	3.22	<b>.001</b>	-0.011	-1.41	.159

<sup>1</sup>*β*, *t*, and - and *p*-values are derived from linear mixed models with handedness and age as fixed covariates and subject as a random variable.

<sup>2</sup>**Bold text** indicates *p* < .05.

**Table S3. Neuropsychological Test Scores: Focal Radiotherapy Patients Only**

	XRT (n=5)		PRT (n=8)		CTL (n =23)	
	Mean(SD)	Min-Max	Mean(SD)	Min-Max	Mean(SD)	Min-Max
FSIQ	89.4 (12.9)	72 – 106	104.4 (11.5)	93 – 129	99.7 (10.9)	84 - 125
VCI	88.0 (11.7)	78 – 107	107.8 (13.7)	92 – 136	98.1 (12.8)	78 – 118
PRI	98.4 (19.0)	75 – 119	108.3 (9.6)	96 – 125	100.0 (12.3)	79 – 125
WMI	94.6 (7.4)	85 – 105	104.5 (14.0)	92 – 135	102.2 (10.3)	88 – 122
PSI	82.8 (20.3)	60 – 103	94.3 (18.2)	72 – 126	101.0 (11.2)	75 – 123
VMI	73.2 (21.3)	50 – 103	95.0 (9.3)	82 – 112	86.5 (11.5)	50 – 104
MC	60.8 (14.4)	45 – 72	88.4 (12.9)	71 – 102	88.1 (11.4)	61 – 102

	XRT vs. PRT		PRT vs. CTL	
	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
FSIQ	-2.57	<b>0.015</b>	-1.08	0.290
VCI	-2.60	<b>0.014</b>	-1.37	0.181
PRI	-1.46	0.155	-1.15	0.259
WMI	-1.71	0.097	-0.90	0.374
PSI	-1.67	0.106	0.36	0.721
VMI	-2.23	<b>0.033</b>	-1.48	0.149
MC	-4.71	<b>&lt;.001</b>	-0.84	0.405

<sup>1</sup>Unadjusted means are presented. *t*- and *p*-values are derived from ANCOVAs with handedness and age as covariates.

<sup>2</sup>**Bold text** indicates *p* < .05.