

ON-LINE APPENDIX

Correlation Matrices for Histogram Parameters

For tumor analysis, distributional parameters were calculated as an output of ROI analysis, including mean, median, mode, SD, skewness, kurtosis, and 10th, 25th, 75th, and 90th percentile values. Pearson correlation coefficients among the mean, median, mode, and 10th, 25th, 75th, and 90th percentiles by type of tissue (ST, PW, or CW) were above 0.90 with many >0.95 , indicating

that examination of multiple measures from this group would likely be redundant and 1 representative measure could be used instead. The SD, skewness, and kurtosis were not highly intercorrelated with each other or with the central tendency and percentile measures. On-line Tables 1–6 list the correlation coefficients between various distributional parameters for each quantitative measurement with respective P values.

On-line Table 1: Solid tumor region—T1 measurements^a

	Pearson Correlation Coefficient ($n = 30$)									
	Prob $> r $ under $H_0: \rho = 0$									
	Tlmean	Tlmedian	Tlmode	TlSD	Tlskewness	Tlkurtosis	Tlp10	Tlp25	Tlp75	Tlp90
Tlmean	1.0000	0.9917	0.9717	0.5031	−0.0093	−0.0313	0.9688	0.9889	0.9928	0.9632
		<.0001	<.0001	.0046	.9612	.8696	<.0001	<.0001	<.0001	<.0001
Tlmedian	0.9917	1.0000	0.9827	0.4922	−0.0675	−0.0039	0.9484	0.9868	0.9841	0.9462
	<.0001		<.0001	.0057	.7229	.9838	<.0001	<.0001	<.0001	<.0001
Tlmode	0.9717	0.9827	1.0000	0.5124	−0.1611	−0.0569	0.9141	0.9676	0.9646	0.9367
	<.0001	<.0001		.0038	.3952	.7653	<.0001	<.0001	<.0001	<.0001
TlSD	0.5031	0.4922	0.5124	1.0000	0.1004	−0.0301	0.3099	0.4038	0.5533	0.6851
	.0046	.0057	.0038		.5976	.8745	.0955	.0269	.0015	<.0001
Tlskewness	−0.0093	−0.0675	−0.1611	0.1004	1.0000	0.4842	0.0684	−0.0531	−0.0530	0.0649
	.9612	.7229	.3952	.5976		.0067	.7194	.7805	.7810	.7335
Tlkurtosis	−0.0313	−0.0039	−0.0569	−0.0301	0.4842	1.0000	0.0011	0.0105	−0.0978	−0.0547
	.8696	.9838	.7653	.8745	.0067		.9953	.9560	.6070	.7743
Tlp10	0.9688	0.9484	0.9141	0.3099	0.0684	0.0011	1.0000	0.9779	0.9436	0.8945
	<.0001	<.0001	<.0001	.0955	.7194	.9953		<.0001	<.0001	<.0001
Tlp25	0.9889	0.9868	0.9676	0.4038	−0.0531	0.0105	0.9779	1.0000	0.9715	0.9215
	<.0001	<.0001	<.0001	.0269	.7805	.9560	<.0001		<.0001	<.0001
Tlp75	0.9928	0.9841	0.9646	0.5533	−0.0530	−0.0978	0.9436	0.9715	1.0000	0.9681
	<.0001	<.0001	<.0001	.0015	.7810	.6070	<.0001	<.0001		<.0001
Tlp90	0.9632	0.9462	0.9367	0.6851	0.0649	−0.0547	0.8945	0.9215	0.9681	1.0000
	<.0001	<.0001	<.0001	<.0001	.7335	.7743	<.0001	<.0001	<.0001	

Note:—p10 indicates the 10th percentile; p25, the 25th percentile; p75, the 75th percentile; and p90, the 90th percentile.

^a The correlation coefficients are the upper values in table cells, and P values are the lower values in table cells.

On-line Table 2: Peritumoral white matter region—T1 measurements^a

	Pearson Correlation Coefficient ($n = 31$)									
	Prob $> r $ under $H_0: \rho = 0$									
	Tlmean	Tlmedian	Tlmode	TlSD	Tlskewness	Tlkurtosis	Tlp10	Tlp25	Tlp75	Tlp90
Tlmean	1.0000	0.9971	0.9813	0.6665	−0.3453	−0.3837	0.9867	0.9921	0.9900	0.9885
		<.0001	<.0001	<.0001	.0571	.0331	<.0001	<.0001	<.0001	<.0001
Tlmedian	0.9971	1.0000	0.9802	0.6398	−0.3913	−0.3620	0.9887	0.9925	0.9828	0.9812
	<.0001		<.0001	.0001	.0295	.0454	<.0001	<.0001	<.0001	<.0001
Tlmode	0.9813	0.9802	1.0000	0.6414	−0.4079	−0.3843	0.9716	0.9698	0.9793	0.9584
	<.0001	<.0001		.0001	.0227	.0328	<.0001	<.0001	<.0001	<.0001
TlSD	0.6665	0.6398	0.6414	1.0000	0.0207	−0.4208	0.5516	0.5805	0.7350	0.7581
	<.0001	.0001	.0001		.9121	.0184	.0013	.0006	<.0001	<.0001
Tlskewness	−0.3453	−0.3913	−0.4079	0.0207	1.0000	0.1279	−0.3938	−0.3637	−0.3248	−0.2663
	.0571	.0295	.0227	.9121		.4928	.0284	.0443	.0746	.1476
Tlkurtosis	−0.3837	−0.3620	−0.3843	−0.4208	0.1279	1.0000	−0.3338	−0.3259	−0.4460	−0.3883
	.0331	.0454	.0328	.0184	.4928		.0665	.0736	.0119	.0309
Tlp10	0.9867	0.9887	0.9716	0.5516	−0.3938	−0.3338	1.0000	0.9932	0.9648	0.9566
	<.0001	<.0001	<.0001	.0013	.0284	.0665		<.0001	<.0001	<.0001
Tlp25	0.9921	0.9925	0.9698	0.5805	−0.3637	−0.3259	0.9932	1.0000	0.9669	0.9687
	<.0001	<.0001	<.0001	.0006	.0443	.0736	<.0001		<.0001	<.0001
Tlp75	0.9900	0.9828	0.9793	0.7350	−0.3248	−0.4460	0.9648	0.9669	1.0000	0.9880
	<.0001	<.0001	<.0001	<.0001	.0746	.0119	<.0001	<.0001		<.0001
Tlp90	0.9885	0.9812	0.9584	0.7581	−0.2663	−0.3883	0.9566	0.9687	0.9880	1.0000
	<.0001	<.0001	<.0001	<.0001	.1476	.0309	<.0001	<.0001	<.0001	

Note:—p10 indicates the 10th percentile; p25, the 25th percentile; p75, the 75th percentile; p90, the 90th percentile.

^a The correlation coefficients are the upper values in table cells, and P values are the lower values in table cells.

On-line Table 3: Contralateral white matter region—T1 measurements^a

Pearson Correlation Coefficient (<i>n</i> = 31) Prob > <i>r</i> under H0: <i>ρ</i> = 0										
	Tlmean	Tlmedian	Tlmode	TlSD	Tlskewness	Tlkurtosis	Tlp10	Tlp25	Tlp75	Tlp90
Tlmean	1.0000	0.9969	0.9840	0.6137	−0.2946	−0.1799	0.9896	0.9943	0.9978	0.9888
		<.0001	<.0001	.0002	.1077	.3327	<.0001	<.0001	<.0001	<.0001
Tlmedian	0.9969	1.0000	0.9807	0.6106	−0.3257	−0.1893	0.9870	0.9903	0.9943	0.9840
	<.0001		<.0001	.0003	.0738	.3079	<.0001	<.0001	<.0001	<.0001
Tlmode	0.9840	0.9807	1.0000	0.5588	−0.3369	−0.1252	0.9731	0.9871	0.9777	0.9665
	<.0001	<.0001		.0011	.0638	.5021	<.0001	<.0001	<.0001	<.0001
TlSD	0.6137	0.6106	0.5588	1.0000	0.3188	−0.0813	0.5253	0.5497	0.6205	0.7027
	.0002	.0003	.0011		.0805	.6639	.0024	.0014	.0002	<.0001
Tlskewness	−0.2946	−0.3257	−0.3369	0.3188	1.0000	0.1657	−0.3333	−0.3550	−0.2949	−0.2037
	.1077	.0738	.0638	.0805		.3729	.0669	.0500	.1073	.2717
Tlkurtosis	−0.1799	−0.1893	−0.1252	−0.0813	0.1657	1.0000	−0.1705	−0.1494	−0.2114	−0.2135
	.3327	.3079	.5021	.6639	.3729		.3590	.4226	.2537	.2489
Tlp10	0.9896	0.9870	0.9731	0.5253	−0.3333	−0.1705	1.0000	0.9900	0.9857	0.9665
	<.0001	<.0001	<.0001	.0024	.0669	.3590		<.0001	<.0001	<.0001
Tlp25	0.9943	0.9903	0.9871	0.5497	−0.3550	−0.1494	0.9900	1.0000	0.9900	0.9745
	<.0001	<.0001	<.0001	.0014	.0500	.4226	<.0001		<.0001	<.0001
Tlp75	0.9978	0.9943	0.9777	0.6205	−0.2949	−0.2114	0.9857	0.9900	1.0000	0.9886
	<.0001	<.0001	<.0001	.0002	.1073	.2537	<.0001	<.0001		<.0001
Tlp90	0.9888	0.9840	0.9665	0.7027	−0.2037	−0.2135	0.9665	0.9745	0.9886	1.0000
	<.0001	<.0001	<.0001	<.0001	.2717	.2489	<.0001	<.0001	<.0001	

Note:—p10 indicates the 10th percentile; p25, the 25th percentile; p75, the 75th percentile; p90, the 90th percentile.

^a The correlation coefficients are the upper values in table cells, and *P* values are the lower values in table cells.

On-line Table 4: Solid tumor region—T2 measurements^a

Pearson Correlation Coefficient (<i>n</i> = 30) Prob > <i>r</i> under H0: <i>ρ</i> = 0										
	T2mean	T2median	T2mode	T2SD	T2skewness	T2kurtosis	T2p10	T2p25	T2p75	T2p90
T2mean	1.0000	0.9839	0.9662	0.6674	−0.3355	−0.1377	0.9335	0.9756	0.9883	0.9570
		<.0001	<.0001	<.0001	.0699	.4679	<.0001	<.0001	<.0001	<.0001
T2median	0.9839	1.0000	0.9785	0.6109	−0.4102	−0.1483	0.9165	0.9721	0.9740	0.9152
	<.0001		<.0001	.0003	.0243	.4342	<.0001	<.0001	<.0001	<.0001
T2mode	0.9662	0.9785	1.0000	0.5980	−0.3752	−0.1105	0.8897	0.9599	0.9472	0.8753
	<.0001	<.0001		.0005	.0411	.5612	<.0001	<.0001	<.0001	<.0001
T2SD	0.6674	0.6109	0.5980	1.0000	0.1742	0.2330	0.4271	0.5847	0.6866	0.7699
	<.0001	.0003	.0005		.3573	.2153	.0186	.0007	<.0001	<.0001
T2skewness	−0.3355	−0.4102	−0.3752	0.1742	1.0000	0.8339	−0.3719	−0.3830	−0.3697	−0.2495
	.0699	.0243	.0411	.3573		<.0001	.0430	.0367	.0444	.1836
T2kurtosis	−0.1377	−0.1483	−0.1105	0.2330	0.8339	1.0000	−0.2256	−0.1415	−0.1805	−0.1506
	.4679	.4342	.5612	.2153	<.0001		.2308	.4559	.3399	.4269
T2p10	0.9335	0.9165	0.8897	0.4271	−0.3719	−0.2256	1.0000	0.9046	0.9102	0.8714
	<.0001	<.0001	<.0001	.0186	.0430	.2308		<.0001	<.0001	<.0001
T2p25	0.9756	0.9721	0.9599	0.5847	−0.3830	−0.1415	0.9046	1.0000	0.9540	0.9021
	<.0001	<.0001	<.0001	.0007	.0367	.4559	<.0001		<.0001	<.0001
T2p75	0.9883	0.9740	0.9472	0.6866	−0.3697	−0.1805	0.9102	0.9540	1.0000	0.9574
	<.0001	<.0001	<.0001	<.0001	.0444	.3399	<.0001	<.0001		<.0001
T2p90	0.9570	0.9152	0.8753	0.7699	−0.2495	−0.1506	0.8714	0.9021	0.9574	1.0000
	<.0001	<.0001	<.0001	<.0001	.1836	.4269	<.0001	<.0001	<.0001	

Note:—p10 indicates the 10th percentile; p25, the 25th percentile; p75, the 75th percentile; p90, the 90th percentile.

^a The correlation coefficients are the upper values in table cells, and *P* values are the lower values in table cells.

On-line Table 5: Peritumoral white matter region—T2 measurements^a

Pearson Correlation Coefficient (<i>n</i> = 31) Prob > <i>r</i> under H0: $\rho = 0$										
	T2mean	T2median	T2mode	T2SD	T2skewness	T2kurtosis	T2p10	T2p25	T2p75	T2p90
T2mean	1.0000	0.9834	0.9536	0.5693	0.1738	0.3217	0.9676	0.9644	0.9705	0.9707
		<.0001	<.0001	.0008	.3497	.0776	<.0001	<.0001	<.0001	<.0001
T2median	0.9834	1.0000	0.9769	0.5059	0.1322	0.3296	0.9542	0.9582	0.9402	0.9333
	<.0001		<.0001	.0037	.4783	.0702	<.0001	<.0001	<.0001	<.0001
T2mode	0.9536	0.9769	1.0000	0.5378	0.0854	0.2998	0.9065	0.9197	0.9249	0.8999
	<.0001	<.0001		.0018	.6479	.1013	<.0001	<.0001	<.0001	<.0001
T2SD	0.5693	0.5059	0.5378	1.0000	−0.0332	−0.0242	0.3814	0.3776	0.7111	0.7010
	.0008	.0037	.0018		.8594	.8974	.0342	.0363	<.0001	<.0001
T2skewness	0.1738	0.1322	0.0854	−0.0332	1.0000	0.8921	0.2186	0.2381	0.1004	0.0933
	.3497	.4783	.6479	.8594		<.0001	.2373	.1972	.5911	.6176
T2kurtosis	0.3217	0.3296	0.2998	−0.0242	0.8921	1.0000	0.3573	0.3997	0.2302	0.1949
	.0776	.0702	.1013	.8974	<.0001		.0484	.0259	.2129	.2935
T2p10	0.9676	0.9542	0.9065	0.3814	0.2186	0.3573	1.0000	0.9687	0.8974	0.9060
	<.0001	<.0001	<.0001	.0342	.2373	.0484		<.0001	<.0001	<.0001
T2p25	0.9644	0.9582	0.9197	0.3776	0.2381	0.3997	0.9687	1.0000	0.8891	0.8975
	<.0001	<.0001	<.0001	.0363	.1972	.0259	<.0001		<.0001	<.0001
T2p75	0.9705	0.9402	0.9249	0.7111	0.1004	0.2302	0.8974	0.8891	1.0000	0.9774
	<.0001	<.0001	<.0001	<.0001	.5911	.2129	<.0001	<.0001		<.0001
T2p90	0.9707	0.9333	0.8999	0.7010	0.0933	0.1949	0.9060	0.8975	0.9774	1.0000
	<.0001	<.0001	<.0001	<.0001	.6176	.2935	<.0001	<.0001	<.0001	

Note:—p10 indicates the 10th percentile; p25, the 25th percentile; p75, the 75th percentile; p90, the 90th percentile.

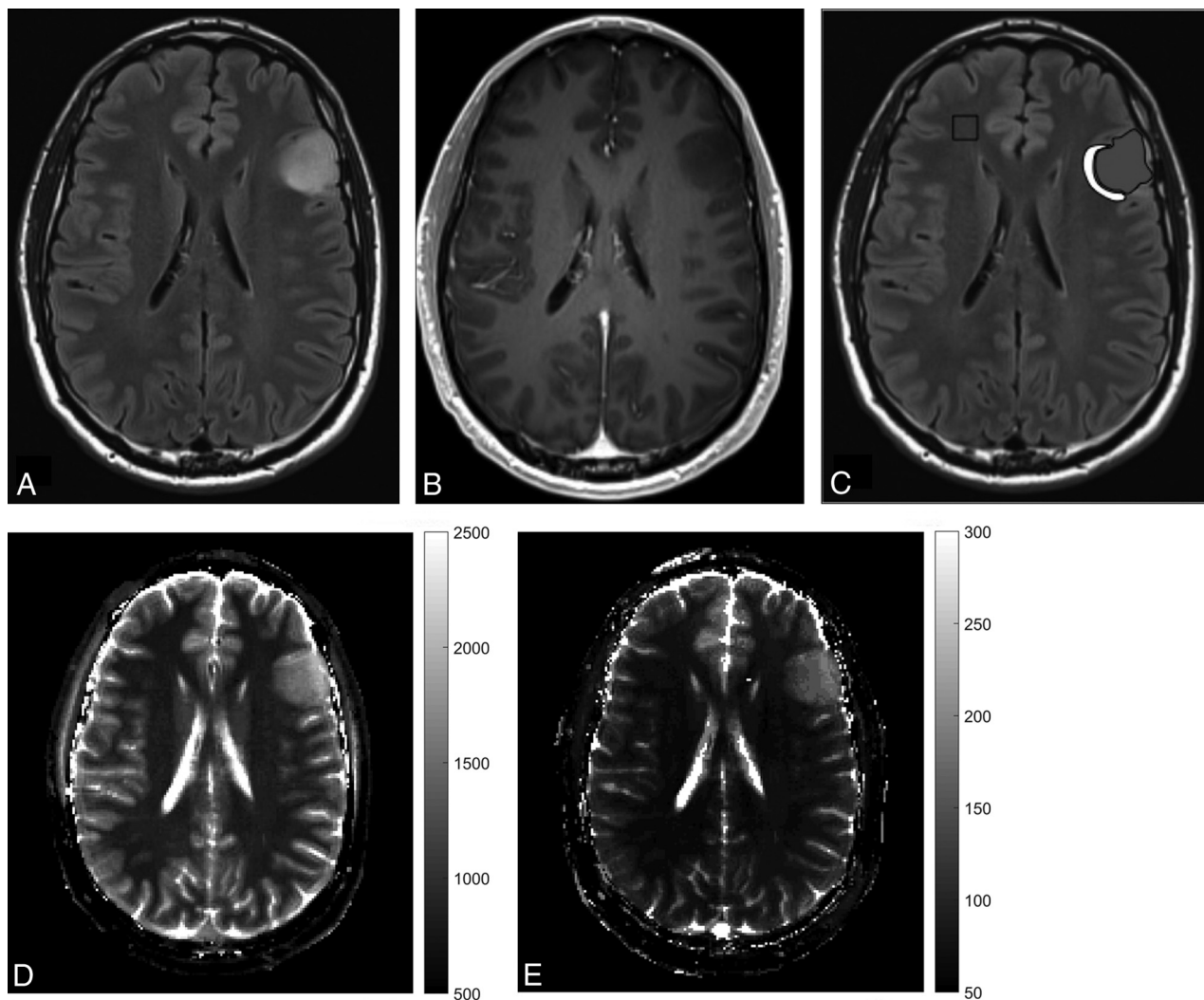
^a The correlation coefficients are the upper values in table cells, and *P* values are the lower values in table cells.

On-line Table 6: Contralateral white matter region—T2 measurements^a

Pearson Correlation Coefficient (<i>n</i> = 31) Prob > <i>r</i> under H0: $\rho = 0$										
	T2mean	T2median	T2mode	T2SD	T2skewness	T2kurtosis	T2p10	T2p25	T2p75	T2p90
T2mean	1.0000	0.9862	0.9826	0.5236	−0.1044	−0.0020	0.9441	0.9798	0.9714	0.9575
		<.0001	<.0001	.0025	.5763	.9915	<.0001	<.0001	<.0001	<.0001
T2median	0.9862	1.0000	0.9933	0.5082	−0.1602	0.0165	0.9185	0.9621	0.9488	0.9246
	<.0001		<.0001	.0035	.3895	.9296	<.0001	<.0001	<.0001	<.0001
T2mode	0.9826	0.9933	1.0000	0.5418	−0.1632	0.0116	0.9086	0.9577	0.9503	0.9375
	<.0001	<.0001		.0016	.3804	.9507	<.0001	<.0001	<.0001	<.0001
T2SD	0.5236	0.5082	0.5418	1.0000	0.2834	−0.3415	0.3313	0.4121	0.5823	0.6718
	.0025	.0035	.0016		.1223	.0600	.0687	.0212	.0006	<.0001
T2skewness	−0.1044	−0.1602	−0.1632	0.2834	1.0000	−0.7698	−0.0925	−0.1679	−0.1102	0.0584
	.5763	.3895	.3804	.1223		<.0001	.6206	.3666	.5552	.7551
T2kurtosis	−0.0020	0.0165	0.0116	−0.3415	−0.7698	1.0000	0.1146	0.0713	−0.0689	−0.0868
	.9915	.9296	.9507	.0600	<.0001		.5392	.7030	.7125	.6424
T2p10	0.9441	0.9185	0.9086	0.3313	−0.0925	0.1146	1.0000	0.9344	0.8920	0.8955
	<.0001	<.0001	<.0001	.0687	.6206	.5392		<.0001	<.0001	<.0001
T2p25	0.9798	0.9621	0.9577	0.4121	−0.1679	0.0713	0.9344	1.0000	0.9338	0.9190
	<.0001	<.0001	<.0001	.0212	.3666	.7030	<.0001		<.0001	<.0001
T2p75	0.9714	0.9488	0.9503	0.5823	−0.1102	−0.0689	0.8920	0.9338	1.0000	0.9333
	<.0001	<.0001	<.0001	.0006	.5552	.7125	<.0001	<.0001		<.0001
T2p90	0.9575	0.9246	0.9375	0.6718	0.0584	−0.0868	0.8955	0.9190	0.9333	1.0000
	<.0001	<.0001	<.0001	<.0001	.7551	.6424	<.0001	<.0001	<.0001	

Note:—p10 indicates the 10th percentile; p25, the 25th percentile; p75, the 75th percentile; p90, the 90th percentile.

^a The correlation coefficients are the upper values in table cells, and *P* values are the lower values in table cells.



ON-LINE FIGURE. Example of study patient, a 39-year-old man presenting with headaches with a final diagnosis of oligodendroglioma. A and B, FLAIR and contrast-enhanced T1-weighted images from the clinical scan demonstrate a nonenhancing expansive FLAIR hyperintense lesion in the left frontal lobe. C, Clinical FLAIR image with ROI overlay. The central gray ROI shows a solid tumor region, the white ROI shows the peritumoral white matter region, and the blank ROI in the contralateral hemisphere denotes the contralateral white matter measurement. D and E, MRF-derived quantitative T1 and T2 maps.