On-line Table 1: Selected sections and landmarks used for brain metrics

Measure (see landmarks 1–8 in Fig 1)	Section	Landmark
Tissue measures		
1, Bifrontal diameter	Coronal T2W	Level of the olfactory sulci, 4 teeth apparent, maximal distance perpendicular to the interhemispheric fissure
2a, b, Frontal lobe height left, right	Coronal T2W	Similar to 1, level of the gyrus rectus
3a, Brain biparietal diameter	Coronal T2W	Level of the third ventricle, cochlea, and basilar truncus apparent
3b, Bone biparietal diameter	Coronal T2W	Level of the third ventricle, cochlea, and basilar truncus apparent, inner limits of the skull
8, Transverse cerebellar diameter	Coronal T2W	Level of the atria (plexus choroid apparent), maximal horizontal distance
9, Fronto-occipital diameter	Sagittal T1W	Midline, maximal distance from the anterior to the posterior edge of the brain
10, Length of the corpus callosum	Sagittal T1W	Midline from the genu to the posterior extremity of the splenium
11, Surface of the vermis	Sagittal T1W	Midline
Fluid measures		
Extra-axial space		
4a, b, Craniocaudal interopercular distance left, right	Coronal T2W	Level of the third ventricle cf biparietal diameter
5, Interhemispheric distance	Coronal T2W	Level of the third ventricle
Intracerebral space		
6, Third ventricle	Coronal T2W	Level of the third ventricle
7a, b, Right and left lateral ventricle atrial diameter	Coronal T2W	Level of the atria (plexus choroid apparent) on an axis perpendicular to that of the ventricle at midheight of the ventricle size (same as transverse cerebellar diameter)

Note:—T2W indicates T2-weighted; T1W, T1-weighted; cf, compared with.

On-line Table 2: Characteristics of the preterm and full-term cohort

Characteristic	Preterm	Term
No.	189	36
Gestational age at birth (weeks), mean (SD)	27.5 (1.9)	38.9 (1.2)
Gestational age at MRI (weeks), mean (SD)	40 (1.3)	40.3 (1.3)
Birth weight (g), mean (SD)	969 (225)	3277 (524)
Weight at MRI (g), mean (SD)	3005 (551)	3482 (482)
Head circumference at MRI (cm), mean (SD)*	34.9 (2.1)	36 (1.4)
No. of males (%)	97 (51)	19 (53)
No. of multiple birth infants (%)	80 (42)	2 (5.6)
No. of intrauterine growth restrictions (%)	21 (11)	1 (3)
No. of white matter injuries (%)		
No	71 (37.6)	0
Mild	84 (44.4)	0
Moderate	27 (14.3)	0
Severe	7 (3.7)	0
No. of Intraventricular hemorrhages, grade 3 or 4 (%)	7 (3.7)	0

Note:—MRI indicates MR imaging.
* Two missing.

On-line Table 3: ICC for intra- and interobserver reliability

	Intraobserver ICC (95% CI)	Interobserver ICC (95% CI)
Bifrontal diameter	0.912 (0.660–0.979)	0.831 [(0.594–0.95)
Left frontal height	0.901 (0.623–0.977)	0.828 (0.588–0.949)
Right frontal height	0.892 [(0.595–0.974)	0.787 [(0.51–0.936)
Brain biparietal diameter	0.988 (0.946–0.974)	0.976 (0.933–0.994)
Bone biparietal diameter	0.998 (0.989–0.999)	0.99 (0.972–0.997)
Transverse cerebellar diameter	0.992 (0.967–0.998)	0.899 (0.738–0.971)
Interhemispheric fissure	0.93 (0.723–0.984)	0.282 (−0.093–0.702)
Third ventricle	0.626 (−0.010–0.901)	0.396 (0.004–0.769)
Left lateral ventricle	0.774 (0.277–0.944)	0.332 (−0.053–0.733)
Right lateral ventricle	0.683 (0.091–0.919)	0.011 (−0.275–0.485)

Note:—ICC indicates intraclass correlation coefficients.

On-line Table 4: Comparison of brain metrics between preterm and term infants

	Preterm			Term			Preterm-Term Differences		
	No.	Mean	SD	No.	Mean	SD	(%)	95% CI	*P*
Bifrontal diameter (mm)	189	64	4.6	36	72.5	4.7	−11.6	−13.8 to −9.3	<.001**
Left frontal height (mm)	189	47.5	5	36	49.3	6	−3.65	−7.45 to 0.16	.06
Right frontal height (mm)	189	47.7	5.1	36	49.8	6.3	−4.4	−8.2 to −0.5	.026*
Brain biparietal diameter (mm)	189	75.1	5	36	85.3	4.6	−10.17	−14 to −9.8	<.001**
Bone biparietal diameter (mm)	189	79.5	5.5	36	89.3	4.3	−11.1	−13.2 to −8.9	<.001**
Transverse cerebellar diameter (mm)	189	50.8	3.3	36	55.6	2.6	−8.7	−10.47 to −6.9	<.001**
Fronto-occipital diameter (mm)	73*	108.97	7.2	13	109.3	4	−0.3	−2.9–2.3	.87
Surface of the vermis (mm^2)	74*	428.2	71	13	428.4	48	−0.07	−9.7–9.5	.989
Length of corpus callosum (mm)	72*	42	4.2	13	42	3.8	−0.4	−5.852–5.042	.98
Interhemispheric fissure (mm)	189	3.4	1.6	36	2.7	1	+29.2	14.2–44.2	.005*
Extra-axial space (biparietal bone diameter–biparietal brain diameter) (mm)	189	4.28	1.7	36	3.99	2.4	+7.2	−9.5–23.9	.395
Third ventricle (mm)	189	2.9	0.9	36	3	0.8	2.5	−9.3 to 14	.675
Interopercular distance Left (mm)	189	1.96	0.8	36	1.91	0.7	−4.1	−18.5 to 10.3	.726
Interopercular distance Right (mm)	189	1.7	0.6	36	1.9	0.9	−10.75	−25.2 to 3.7	.176
Left lateral ventricle (mm)	189	7	3.3	36	5.7	1.5	+22.3	2.94 to 41.7	.006*
Right lateral ventricle (mm)	189	6.5	2.8	36	5.8	1.6	+11.7	−4.68 to 28.1	.146

* Good quality sagittal sections were not available for the entire cohort.

On-line Table 5: Multivariate analysis by linear regression, studying the effects of the study group (full-term infants as reference group), sex (female as reference group), and GA at MR imaging on brain metrics (unstandardized regression coefficients and 95 % CIs)

Brain Measure	Preterm Group	GA at MRI (per week)	Male	% Variance Explained
Bifrontal diameter	−7.7 (−9.2 to −6.2)†	1.1 (0.6–1.5)†	2.4 (1.4–3.5)†	42.5
Biparietal diameter	−9.3 (−11.0 to −7.7)†	1.4 (0.9–1.9)†	1.6 (0.4–2.8)†	46.5
Transverse cerebellar diameter	−4.1 (−5.1 to −3.1)†	1.3 (1.0–1.6)†	0.4 (−0.3–1.1)	44.2
Fronto-occipital diameter	0.2 (−0.4–0.4)	1.6 (0.05–0.3)*	0.16 (−0.1–0.4)	7.9
Corpus callosum length	0.01 (−0.22–0.23)	0.06 (−0.002–0.13)	0.05 (−0.12–0.21)	1.7

Note:—GA indicates gestational age.
* $P < .05$.
† $P < .001$.

On-line Table 6: Correlation coefficients between brain metrics, head circumference, and volumetric data

	Tissue Measures					Fluid Measures			
Pearson Correlation	Bifrontal Diameter	Left Frontal Height	Right Frontal Height	Brain Biparietal Diameter	Transverse Cerebellar Diameter	IHD	Right Ventricle Diameter	Left Ventricle Diameter	Third Ventricle
Total tissue (no CSF)	0.663†	0.357†	0.331†	0.626†	0.707†	0.027	0.079	−0.034	0.234†
Cortical gray matter	0.482†	0.144*	0.132	0.538†	0.658†	0.018	0.048	−0.049	0.133
Myelinated white matter	0.023	−0.030	−0.038	0.103	0.112	−0.070	0.093	0.076	0.126
Unmyelinated white matter	0.589†	0.455†	0.421†	0.446†	0.441†	0.037	0.099	0.016	0.247†
Basal ganglia	0.413†	0.325†	0.319†	0.371†	0.427†	0.006	−0.204†	−0.247†	0.053
CSF	0.088	0.111	0.108	0.135	0.082	0.478†	0.482†	0.481†	0.520†
Head circumference	0.549†	0.279†	0.239†	0.465†	0.558†	0.216†	0.168*	0.09	0.312†

Note:—IHD indicates interhemispheric distance.
* Correlation is significant at the 0.05 level (2-tailed).
† Correlation is significant at the 0.01 level (2-tailed).