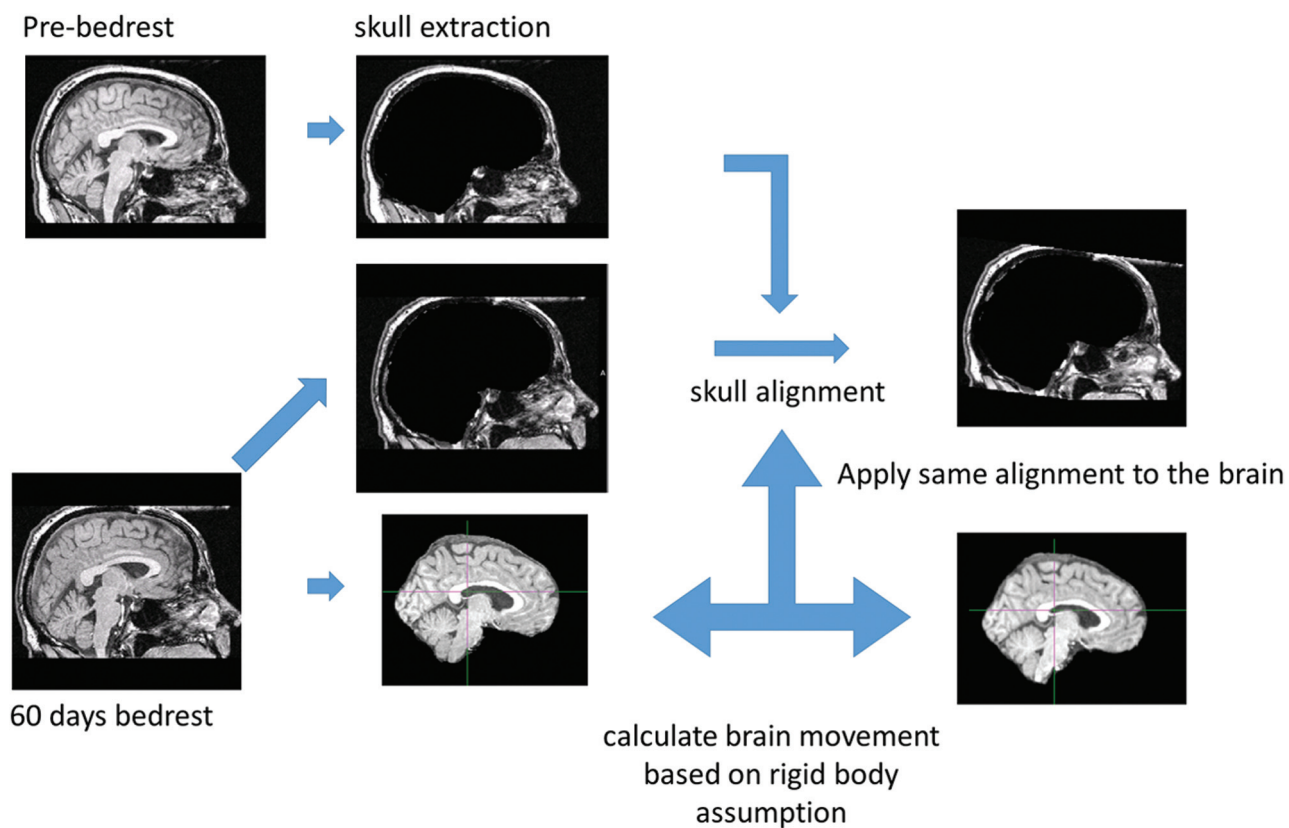
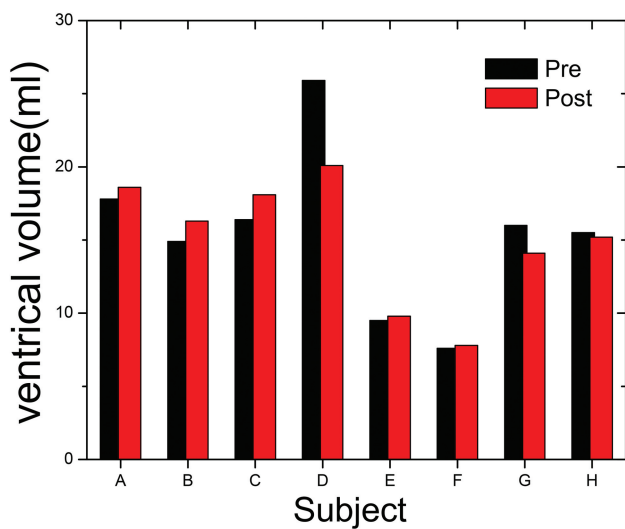
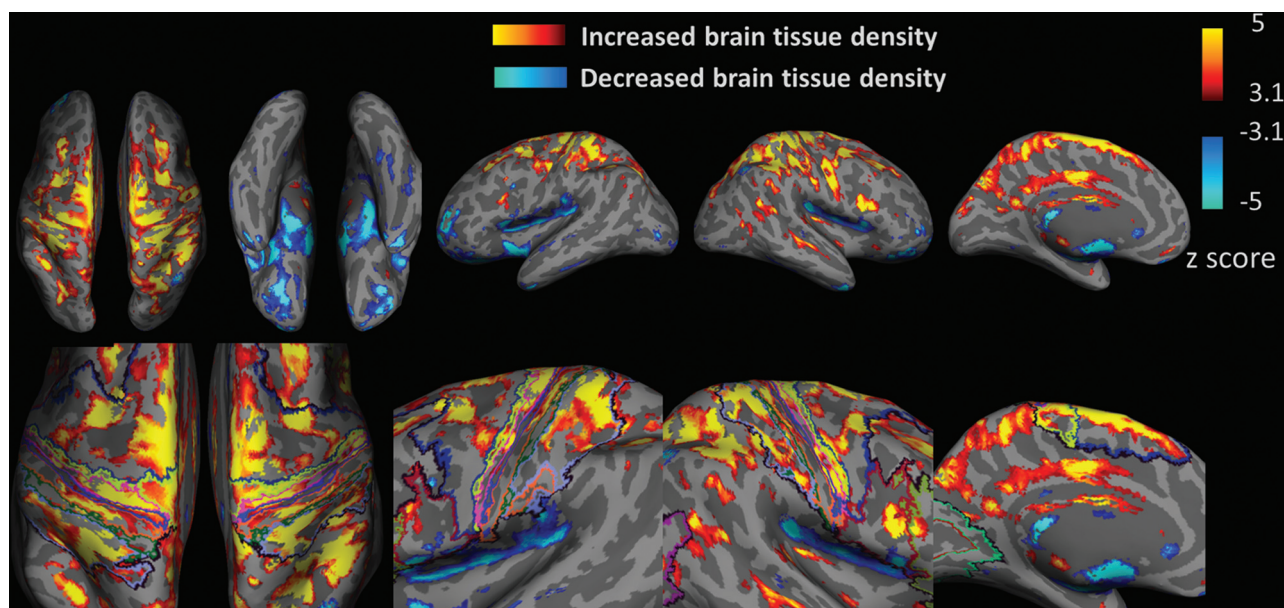




ON-LINE FIG 1. Method used to compare brain movement in reference to the skull post-bed rest compared with pre-bed rest.



ON-LINE FIG 2. Individual variability of ventricle sizes pre- and post-bed rest.



ON-LINE FIG 3. Morphologic brain changes after bed rest. Images were thresholded at $P = .001$ ($t = 3.1$, uncorrected). Areas demonstrating a significant increase in tissue density include the premotor cortex, primary motor cortex, sensory cortex, posterior cingulate, cuneus, thalami, and cerebellum. Areas demonstrating a significant decrease in tissue density include the orbital frontal cortex, the hippocampi, corpus callosum, striatum, anterior cingulate, parietal operculum, and brain stem. The lower part of figure illustrates the detailed region-specific morphologic changes along the central frontoparietal lobes (Brodmann areas 1–4, and 6).

On-line Table 1: Pre- and post-bed rest MRI and physiologic measurements of each individual subject: ventricular volume changes

Subject	Ventricle Volume (mL)			ICV (mL)		
	Pre-	Post-	% Change	Pre-	Post-	% Change
A	17.8	18.6	4.49	1478.03	1539.715	4.17
B	14.9	16.3	9.40	1544.76	1536.875	−0.51
C	16.4	18.1	10.37	1237.14	1264.736	2.23
D	25.9	20.1	−22.39	1314.64	1306.586	−0.61
E	9.5	9.8	3.16	1442.641	1418.503	−1.67
F	7.6	7.8	2.63	1485.153	1476.686	−0.57
G	16	14.1	−11.88	1513.267	1493.296	−1.32
H	15.5	15.2	−1.94	1394.071	1363.476	−2.19

On-line Table 2: Pre- and post-bed rest MRI and physiologic measurements of each individual subject: tissue volume changes

Subject	Segmentations: Pre-			Segmentations: Post-			Segmentations: % Change		
	Gray Matter (mL)	White Matter (mL)	CSF (mL)	Gray Matter (mL)	White Matter (mL)	CSF (mL)	Gray Matter	White Matter	CSF
A	634.003	608.327	176.676	646.205	599.96	185.901	1.92	−1.38	5.22
B	645.046	594.763	194.43	635.428	602.231	207.864	−1.49	1.26	6.91
C	512.001	450.364	183.82	497.612	479.463	187.481	−2.81	6.46	1.99
D	600.404	480.711	155.842	614.111	479.162	151.547	2.28	−0.32	−2.76
E	626.513	536.312	194.592	626.343	543.333	190.212	−0.03	1.31	−2.25
F	608.24	567.192	205.481	664.345	535.693	190.072	9.22	−5.55	−7.50
G	607.562	603.347	192.34	620.715	586.225	196.525	2.16	−2.84	2.18
H	596.725	527.404	183.643	616.305	500.013	183.005	3.28	−5.19	−0.35

On-line Table 3: Pre- and post-bed rest MRI and physiologic measurements of each individual subject: physiologic measurement changes

Subject	Plasma Volume (mL)			Blood Volume (mL)			Average Daily Water Consumption (mL)		Urine Cortisol (μ g/dL)		
	Pre-	Post-	% Change	Pre-	Post-	% Change	In	Out	Pre-	Post-	% Change
A	2.79	2.43	−12.90	5.05	4.5	−10.89	2833.58	3679.17	3.2825	3.525	7.39
B	2.93	3	2.39	5.48	5.56	1.46	2313.18	2849.51	4.2575	3.9575	−7.05
C	2.35	1.68	−28.51	3.59	2.73	−23.96	2315.00	2724.95	2.382	2.34	−1.76
D	2.4	2.05	−14.58	3.59	3.18	−11.42	1951.70	2729.23	2.06	3.25	57.77
E	2.53	2.17	−14.23	4.42	3.84	−13.12	2710.41	3476.33	2.095	2.52	20.29
F	1.97	1.82	−7.61	3.14	2.78	−11.46	1451.55	2056.24	3.0775	3.122	1.45
G	3.07	2.5	−18.57	5.76	4.83	−16.15	2693.05	3450.07	2.875	4.25	47.83
H	2.97	2.77	−6.73	5.5	5.23	−4.91	2824.98	3829.86	1.0425	5.66	442.93

On-line Table 4: Pre- and post-bed rest MRI and physiologic measurement of each individual subject: brain movement parameters

Subject	Translation (mm)			Rotation (degree)		
	X	Y	Z	X	Y	Z
A	0.0342	−0.0938	0.5978	−0.3976	0.0442	−0.1146
B	−0.0293	−0.4294	0.2736	−0.5308	0.0352	−0.1050
C	−0.0464	0.0910	0.4365	−0.9826	−0.0537	0.0813
D	0.1371	−0.0924	0.1350	−0.2074	−0.6152	0.2125
E	−0.0409	−0.3694	0.2374	−0.0618	−0.1284	0.1298
F	−0.0448	−0.2971	0.4310	−0.0109	−0.0402	−0.0541
G	−0.1294	−0.2020	0.3289	0.0386	−0.0873	−0.0423
H	0.0283	−0.2522	0.4651	−0.1223	0.0944	0.0281