

Table E1. Normal Ranges for Serum Measures

Parameter	All Subjects and Ages	Female Subjects				Male Subjects		
		8.3–9.7 y	10.5–11.4 y	11.5–17.7 y	≥18.1 y	8.6–10 y	10.3–17.7 y	≥18.2 y
TIBC (mcg/dL)	261–497	NA	NA	NA	NA	NA	NA	NA
Tf saturation (%)	15–50	NA	NA	NA	NA	NA	NA	NA
Tf (mg/dL)	200–400	NA	NA	NA	NA	NA	NA	NA
RDW (%)	11.5–14.5	NA	NA	NA	NA	NA	NA	NA
RCC (10 ×12/L)	NA	4–5.3	4–5.3	4.1–5.3	4.1–5.7	4–5.3	4.2–5.6	4–6
Hb (g/dL)	NA	11.5–14.5	12–15	12–15	12–15.5	11.5–14.5	12.5–16.1	13.5–17
Hct (%)	NA	33–43	35–47	35–47	36–47	33–43	36–47	39–51
MCV (fL)	NA	76–90	78–95	78–95	82–100	76–90	78–95	82–100
MCH (pg)	NA	25–31	26–32	26–32	25–33	25–31	26–32	25–33

Note.—Normal ranges are provided by the New York University Hospital Center Clinical Laboratories. Hb = hemoglobin, Hct = hematocrit, MCH = mean corpuscular hemoglobin, MCV = mean corpuscular volume, NA = not applicable, Tf = transferrin, TIBC = total iron binding capacity, RCC = red blood cell count, RDW = red blood cell distribution width. The normal ranges for iron are 37–170 mcg/dL for female subjects and 49–181 mcg/dL for male subjects. The normal ranges for ferritin are 10–143 ng/mL for female subjects and 30–440 ng/mL for male subjects.

Table E2. ADHD Group Demographics

Parameter	ADHD Group (n = 22)*	Control vs ADHD Group Comparisons		
		t [†]	U [†]	P Value
Medication history				
Medicated	10 (45) [§]	NA	NA	NA
Nonmedicated	12 (55) [§]	NA	NA	NA
Type of ADHD				
Combined	14 (64) [§]	NA	NA	NA
Inattentive	8 (36) [§]	NA	NA	NA
Comorbidity				
No	11 (50) [§]	NA	NA	NA
Yes	11 (50) [§]	NA	NA	NA
Male subjects	15 (68) [§]	NA	NA	.10||
Age (y)	12.6 ± 2.8	–0.8 (44)	NA	.40
WASI				
FSIQ	106.8 ± 15.6	–1.0 (44)	NA	.30
VIQ	107.0 ± 16.1	–0.7 (42)	NA	.46
PIQ	105.5 ± 15.7	–1.1 (45)	NA	.26
CPRS-R:L (T score)				
ADHD Index	72.8 ± 11.7	NA	2.0	<.001
DSM-IV Inattentive	73.8 ± 9.9	NA	2.0	<.001
DSM-IV Hyperactive-Impulsive	67.4 ± 12.0	NA	24.0	<.001
DSM-IV Total	72.2 ± 13.5	NA	30.0	<.001
BRIEF-Parent (T score)				
Behavioral Regulation Index	61.9 ± 10.1	NA	34.0	<.001
Metacognition Index	74.6 ± 10.2	NA	3.5	<.001
Global Executive Composite	71.6 ± 9.1	NA	2.0	<.001

Note.—BRIEF-Parent = Behavioral Rating Inventory of Executive Function-Parent Version, CPRS-R:L = Conners Parent Rating Scale-Revised-Long Version, FSIQ = full scale IQ, NA = not applicable, PIQ = performance IQ, VIQ = verbal IQ, WASI = Wechsler Abbreviated Scale of Intelligence.

* Data are means \pm standard deviations unless otherwise noted.

§ Data are numbers of subjects, with percentages in parentheses.

† Group comparisons (control subjects [see Table 1], ADHD patients) performed with Student *t* test (two tailed, unequal variances assumed). Numbers in parentheses are the *df*.

‡ Performed with Mann-Whitney *U* test (two tailed).

§ Data are numbers of subjects, with percentages in parentheses.

|| Pearson χ^2 (*df* = 1, *n* = 49) = 2.8 (two sided).

Table E3. Subgroup Comparisons: MFC Indexes of Brain Iron in Voxels Dominated by Microscopic Contributions to MFC

ROI	Control Group (<i>n</i> = 27)*	ADHD-Medicated Subgroup (<i>n</i> = 10)*	ADHD-Nonmedicated Subgroup (<i>n</i> = 12)*	Subgroup Comparisons [†]			Control Group vs ADHD-Medicated Subgroups [§]		Control Group vs ADHD-Nonmedicated Subgroup [§]		ADHD-Medicated vs ADHD-Nonmedicated Subgroups [§]	
				$F_{2,46}^{\ddagger}$	<i>P</i> Value	η^2	<i>P</i> Value	r_{tb}	<i>P</i> Value	r_{tb}	<i>P</i> Value	r_{tb}
GP	475 ± 148	445 ± 69	372 ± 88	2.9	.065	0.11	NA	NA	NA	NA	NA	NA
PUT	204 ± 57	211 ± 28	160 ± 35	8.8 (2)||	.012	0.18	.289	0.2	.019	0.5	.006	0.7
CN	250 ± 88	240 ± 33	182 ± 36	12.6 (2)||	.002	0.26	.918	0.0	.002	0.6	.002	0.8
THL	194 ± 53	198 ± 49	160 ± 25	8.3 (2)||	.016	0.17	.682	0.1	.007	0.6	.025	0.6

Note.—CN = caudate nucleus, GP = globus pallidus, NA = not applicable, PUT = putamen, THL = thalamus.

* Data are total MFC (seconds⁻²) in means ± standard deviations.

[†] Subgroup comparisons (control group, ADHD-medicated subgroup, ADHD-nonmedicated subgroup; FDR corrected, *P* ≤ .024).

[‡] Performed with one-way analysis of variance unless otherwise noted.

[§] Posthoc multiple comparisons (FDR corrected, *P* ≤ .025). *P* values were determined with the two-tailed Mann-Whitney *U* test.

^{||} Obtained with the Kruskal-Wallis test. Data are χ^2 , with *df* in parentheses.

Table E4. Head Motion Analyses of MFC, T2, and T2* Images

0-Shift Image and Cohort	CSF SNR*	Ghosting Signal*
MFC (TE: 40 msec)		
Control group	41.5 ± 3.7	39.8 ± 4.7
ADHD-medicated subgroup	39.1 ± 2.9	40.2 ± 2.2
ADHD-nonmedicated subgroup	40.8 ± 2.4	38.9 ± 3.3
T2 (TE:15 msec)		
Control group	105.7 ± 14.3	12.7 ± 5.1
ADHD-medicated subgroup	104.9 ± 12.6	14.0 ± 5.4
ADHD-nonmedicated subgroup	110.3 ± 15.5	12.9 ± 2.6
T2* (TE:7 msec)		
Control group	49.6 ± 4.1	19.2 ± 12.0
ADHD-medicated subgroup	49.1 ± 4.2	16.1 ± 3.2
ADHD-nonmedicated subgroup	49.1 ± 2.2	14.3 ± 6.8

Note.—Subgroup comparisons (control group, ADHD-medicated subgroup, ADHD-nonmedicated subgroup) were performed with one-way analysis of variance. For subgroup comparisons, $F_{2,46}$ was 2.0 and 0.3, respectively, for cerebrospinal fluid SNR and ghosting signal in MFC ($P = .148$ and $.721$, respectively), 0.5 and 0.3 for T2 ($P = .591$ and $.752$), and 0.1 and 1.1 for T2* ($P = .898$ and $.331$). CSF = cerebrospinal fluid, TE = echo time.

* Data are means ± standard deviations.

Table E5. Dietary Iron Intake and Serum Ferritin Level

Measure	Control Group ($n = 27$)*	ADHD-Medicated Subgroup ($n = 10$)*	ADHD-Nonmedicated Subgroup ($n = 12$)*	Subgroup Comparisons: Kruskal-Wallis Test		Subgroup Comparisons: Fisher Exact Test	
				χ^2 †	P Value	Fisher Exact	P Value
Dietary heme iron intake (mg/d)	2.4 ± 1.9	2.1 ± 1.2	3.1 ± 3.0	0.6 (2)	.72	...	...
Dietary non-heme iron intake (mg/d)	4.1 ± 4.5	2.7 ± 2.9	2.9 ± 1.9	1.4 (2)	.51	...	...
Ferritin level (ng/mL)	38.2 ± 22.8	50.3 ± 26.1	51.3 ± 24.1	1.7 (2,46)‡	.19	...	...
Ferritin normalized level§	0.12 ± 0.2	0.11 ± 0.1	0.14 ± 0.2	0.5 (2)	.77	...	...
No. of subjects taking multivitamins	7 (26)	5 (50)	6 (50)	...	...	3.1	.22
No. of subjects with ferritin level ≤15 ng/mL	4 (15)	1 (10)	0 (0)	...	...	1.7	.38
No. of subjects with ferritin level ≤30 ng/mL	12 (44)	2 (20)	3 (25)	...	...	2.4	.29
No. of subjects with ferritin level ≤45 ng/mL	18 (67)	5 (50)	7 (53)	...	...	1.0	.68

* Data are means ± standard deviations unless otherwise noted. Numbers in parentheses are percentages.

† Numbers in parentheses are the *df*.

‡ Obtained with one-way analysis of variance and is the *F* value, with *df* in parentheses.

§ Ratio within normal range for age and/sex.

Table E6. Complete Serum Measures

Measure	Control Group*	ADHD-Medicating Subgroup*	ADHD-Nonmedicated Subgroup*	Subgroup Comparison	
				$F_{2,46}^{\dagger}$	<i>P</i> Value
Blood draw time [‡]	14.8 ± 3.1	15.2 ± 2.3	15.1 ± 3.5	0.1 (2) [§]	.95
Iron (mcg/dL)	65.7 ± 28.2	79.5 ± 23.3	74.8 ± 27.9	1.1	.34
TIBC (mcg/dL)	357.7 ± 54.8	352.3 ± 35.8	357.5 ± 41.4	0.0	.95
Tf saturation (%)	18.6 ± 7.6	22.9 ± 6.8	21.6 ± 9.2	1.3	.28
Tf (mg/dL)	290.8 ± 38.4	288.2 ± 26.2	293.1 ± 33.1	0.1	.95
RCC (10 x12/L)	4.7 ± 0.5	5.1 ± 0.4	4.6 ± 0.3	4.0	.02
Hb (g/dL)	13.3 ± 1.2	14.2 ± 1.0	13.1 ± 1.3	2.9	.06
Hct (%)	39.4 ± 3.5	41.9 ± 3.6	38.6 ± 3.1	2.7	.08
MCV (fL)	84.4 ± 5.1	82.6 ± 2.8	84.0 ± 3.7	2.0 (2) [§]	.37
MCH (pg)	28.5 ± 2.1	28.1 ± 1.0	28.5 ± 1.5	0.2	.85
RDW (%)	12.1 ± 1.0	12.1 ± 0.8	12.2 ± 0.6	0.1	.92
Iron norm	0.1 ± 0.2	0.26 ± 0.2	0.23 ± 0.2	0.6	.54
RCC norm	0.47 ± 0.3	0.70 ± 0.2	0.40 ± 0.2	3.4	.04
Hb norm	0.38 ± 0.3	0.57 ± 0.2	0.29 ± 0.4	4.6 (2) [§]	.10
Hct norm	0.39 ± 0.3	0.58 ± 0.3	0.32 ± 0.3	2.3	.12
MCV norm	0.40 ± 0.3	0.29 ± 0.2	0.39 ± 0.2	0.5	.58
MCH norm	0.45 ± 0.4	0.38 ± 0.2	0.47 ± 0.3	0.2	.79

Note.—Hb = hemoglobin, Hct = hematocrit, MCH = mean corpuscular hemoglobin, MCV = mean corpuscular volume, norm = normalized-ratio within normal range for age and/sex, Tf = transferrin, TIBC = total iron binding capacity, RCC = red blood cell count, RDW = red blood cell distribution width.

* Data are means ± standard deviations.

‡ Time: 24 hour clock.

† Performed with one-way analysis of variance unless otherwise noted; none survived FDR correction.

§ Determined with the Kruskal-Wallis test. Data are χ^2 , with *df* in parentheses; none survived FDR correction.

