

**Chronic white matter changes detected using diffusion tensor imaging  
following adult traumatic brain injury and their relationship to cognition**

**Supplementary Material**

Table S1. Comparison of healthy and orthopaedic control groups (demographic, cognitive performance and diffusion tensor imaging)

	healthy controls			orthopaedic controls					
	<i>N</i>	<i>mean</i>	<i>SD</i>	<i>N</i>	<i>mean</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p-value</i>
<i>cognitive performance</i>									
WMSIII - Logical Memory immediate (LM-I)	58	10.64	3.12	45	10.62	2.98	-.026	101	.979
WMSIII - Logical Memory delayed (LM-II)	58	11.33	2.97	45	11.20	2.96	-.217	101	.829
WMSIII - Visual Reproduction immediate (VR-I)	58	10.93	3.37	45	10.69	2.71	-.393	101	.695
WMSIII - Visual Reproduction delayed (VR-II)	58	12.22	3.54	45	12.98	3.12	1.129	101	.262
4-choice compatible visual RT task	57	436.96	96.22	45	436.11	84.65	-.047	100	.963
4-choice incompatible visual RT task	57	645.98	200.28	45	627.87	136.93	-.518	100	.605
COWA	58	43.21	11.77	45	42.98	13.37	-.092	101	.927
<i>DTI findings: FA</i>									
corpus callosum – genu	59	.49	.05	47	.49	.04	.140	104	.889
corpus callosum – body	59	.54	.05	47	.54	.04	.741	104	.460
corpus callosum – splenium	59	.62	.04	47	.62	.04	.081	104	.936
fornix	59	.33	.09	47	.33	.08	-.224	104	.823
superior longitudinal fasciculus	59	.44	.02	47	.44	.02	.124	104	.901
<i>DTI findings: MD</i>									
corpus callosum – genu	59	.52	.03	47	.52	.02	-.477	104	.635
corpus callosum – body	59	.52	.04	47	.51	.02	-.854	104	.395
corpus callosum – splenium	59	.50	.02	47	.50	.02	.318	104	.751
fornix	59	.84	.14	47	.82	.10	-.705	104	.482
superior longitudinal fasciculus	59	.47	.02	47	.47	.01	-.281	104	.779

*Note.* N = number of participants; SD = standard deviation; t = t-test; df = degrees of freedom; WMSIII = Wechsler Memory Scale-third edition; RT = reaction time; COWA = Controlled Oral Word Association Test; DTI = diffusion tensor imaging; FA = fractional anisotropy; MD = mean diffusivity

Table S2. Partial correlations<sup>1</sup> (p-value) between cognitive tests<sup>2</sup> and diffusion tensor imaging findings (fractional anisotropy & mean diffusivity) for the moderate to severe TBI and control groups

	CC genu	CC body	CC splenium	fornix	SLF
<u><b>fractional anisotropy (FA)</b></u>					
<b>moderate-severe TBI</b>					
WMSIII - Visual Reproduction delayed	.02 (.915)	-.10 (.612)	-.15 (.462)	-.02 (.933)	-.08 (.718)
4-choice compatible visual RT task	.27 (.180)	.36 (.068)	.45 (.021)	.31 (.127)	.38 (.055)
COWA	.10 (.612)	.14 (.498)	.24 (.234)	-.01 (.951)	.20 (.330)
<b>controls</b>					
WMSIII - Visual Reproduction delayed	-.35 (.026)	-.21 (.183)	-.05 (.746)	-.15 (.337)	-.38 (.014)
4-choice compatible visual RT task	.11 (.507)	.14 (.400)	.05 (.762)	.22 (.162)	.09 (.566)
COWA	-.43 (.005)	-.15 (.359)	-.32 (.045)	.14 (.384)	-.07 (.651)
<u><b>mean diffusivity (MD)</b></u>					
<b>moderate-severe TBI</b>					
WMSIII - Visual Reproduction delayed	.07 (.739)	-.09 (.662)	-.10 (.621)	.01 (.954)	-.08 (.682)
4-choice compatible visual RT task	.31 (.122)	.39 (.051)	.43 (.027)	.22 (.288)	.46 (.018)
COWA	.06 (.755)	.04 (.832)	.07 (.729)	-.05 (.797)	.09 (.648)
<b>controls</b>					
WMSIII - Visual Reproduction delayed	-.29 (.065)	-.18 (.249)	-.02 (.928)	-.12 (.470)	-.24 (.133)
4-choice compatible visual RT task	.03 (.865)	.11 (.515)	.11 (.508)	.12 (.451)	-.06 (.704)
COWA	-.32 (.039)	-.09 (.564)	-.17 (.285)	.10 (.535)	-.13 (.403)

Note. <sup>1</sup>age, sex, time post-injury and education were controlled; <sup>2</sup>correlations were only calculated for cognitive tests in which the moderate to severe TBI performed significantly worse than controls, after controlling for the effects of age, sex, time post-injury and education; TBI = traumatic brain injury; CC = corpus callosum; SLF = superior longitudinal fasciculus; WMSIII = Wechsler Memory Scale-third edition (N<sub>moderate-severe</sub>=31, N<sub>controls</sub>=103); RT = reaction time; 4-choice compatible visual RT task (N<sub>moderate-severe</sub>=30, N<sub>controls</sub>=102); COWA = Controlled Oral Word Association Test (N<sub>moderate-severe</sub>=31, N<sub>controls</sub>=103)