Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

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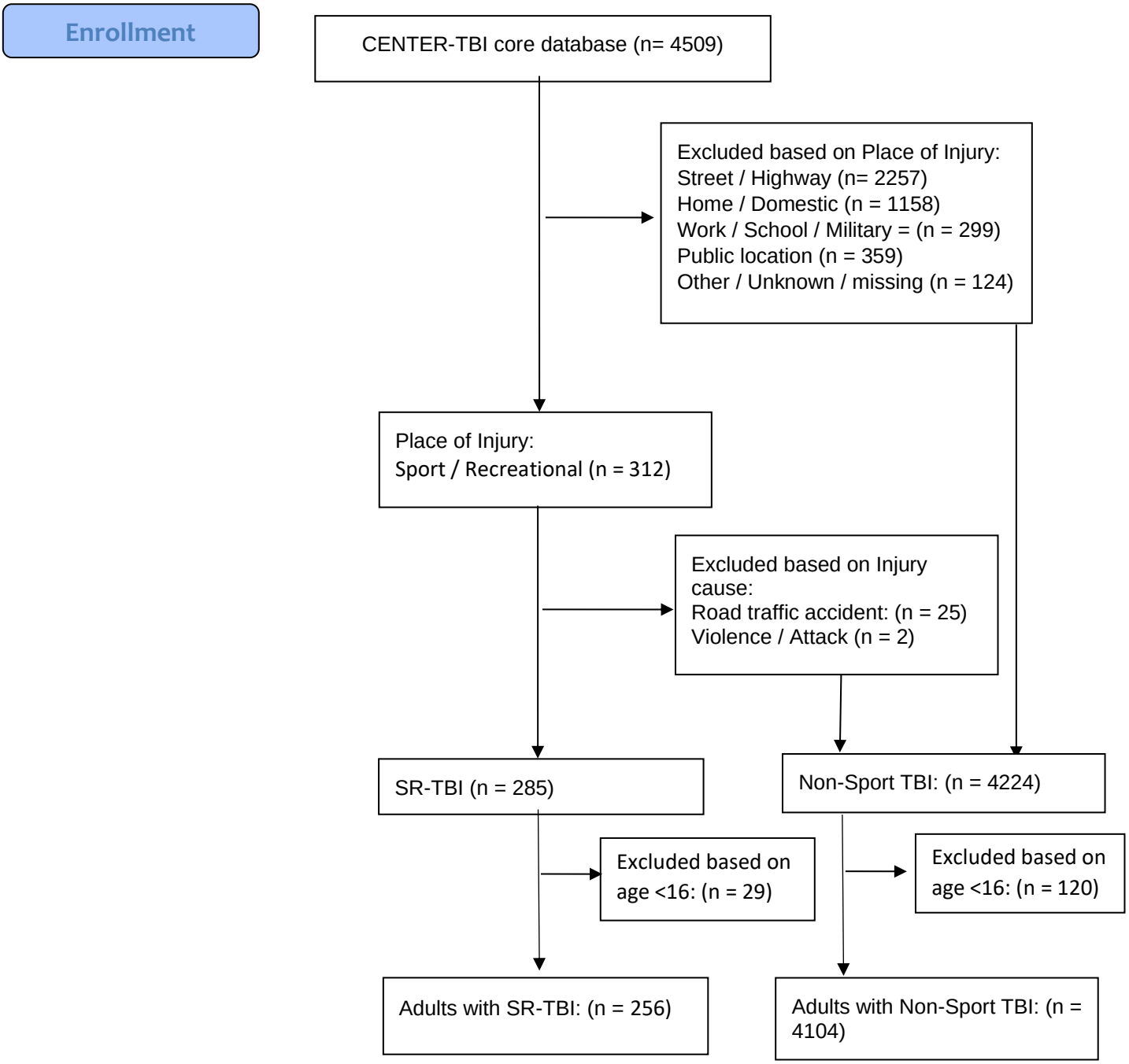
eFigure 1. CONSORT flow diagram.



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eTable 1a. Completion rates for outcomes at each timepoint, % out of 4360 patients

Outcome	N at 3 months (%)	N at 6 months (%)
GOSE	3650 (84)	3674 (84)
SF-12v2 PCS	2222 (51)	2224 (51)
SF-12v2 MCS	2222 (51)	2224 (51)
RPQ	2084 (48)	2167 (50)
PHQ-9	2044 (47)	2125 (49)
GAD-7	2039 (47)	2122 (49)
PCL-5	2037 (47)	2116 (49)

Note. N = sample size.

eTable 1b Completion rates for outcomes at each timepoint, % out of 256 SR-TBI patients

Outcome (SR-TBI)	N at 3 months (%)	N at 6 months (%)
GOSE	222 (87)	223 (87)
SF-12v2 PCS	165 (64)	160 (63)
SF-12v2 MCS	165 (64)	160 (63)
RPQ	158 (62)	156 (61)
PHQ-9	152 (59)	155 (60)
GAD-7	151 (59)	153 (60)
PCL-5	157 (61)	155 (60)

Note. N = sample size.

eTable 1c Completion rates for outcomes at each timepoint, % out of 4104 non-SR-TBI patients

Outcome (TBI)	N at 3 months (%)	N at 6 months (%)
GOSE	3428 (84)	3451 (84)
SF-12v2 PCS	2057 (50)	2064 (50)
SF-12v2 MCS	2057 (50)	2064 (50)
RPQ	1926 (47)	2011 (49)
PHQ-9	1892 (46)	1970 (48)
GAD-7	1888 (46)	1969 (48)
PCL-5	1880 (46)	1961 (48)

Note. N = sample size.

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eTable 2. Numbers (percentages and 95% confidence intervals) of impaired outcomes at 3 and 6 months.

Timepoint	Outcome measure	SR-TBI	mild SR-TBI	mild SR-TBI & negative CT	Non-sport TBI	Non-sport mild TBI	Non-sport mild TBI & negative CT
		n (% [95% CI])	n (% [95% CI])	n (% [95% CI])	n (% [95% CI])	n (% [95% CI])	n (% [95% CI])
3 months	GOSE	115 (52 [45-56])	70 (42 [35-49])	32 (33 [24-43])	2390 (70 [68-72])	1289 (59 [57-61])	524 (48 [45-51])
	RPQ	35 (22 [16-29])	23 (19 [13-27])	14 (22 [12-34])	587 (31 [29-33])	409 (28 [26-31])	167 (23 [20-27])
	PHQ-9	20 (13 [8-20])	14 (12 [7-20])	8 (13 [6-24])	379 (20 [18-22])	270 (19 [17-21])	126 (18 [15-21])
	GAD-7	11 (7 [4-12])	6 (5 [2-11])	4 (7 [2-16])	325 (17 [16-19])	238 (17 [15-19])	108 (15 [12-18])
	PCL-5	5 (3 [1-7])	2 (2 [0-6])	0	213 (11 [10-13])	165 (12 [10-13])	83 (12 [10-14])
	PCS	36 (22 [16-29])	22 (18 [11-26])	10 (14 [7 – 28])	787 (38 [36-40])	511 (36 [34-39])	247 (36 [32-39])
	MCS	38 (23 [19-30])	27 (21 [14-29])	17 (24 [15-36])	580 (29 [27-31])	405 (29 [27-31])	181 (27 [23-30])
6 months	GOSE	103 (46 [40-53])	65 (39 [31-46])	30 (31 [22-41])	2233 (65 [63-67])	1146 (52 [50-54])	437 (40 [37-43])
	RPQ	22 (14 [9-21])	15 (12 [7-19])	5 (7 [2-16])	603 (30 [28-32])	411 (28 [26-30])	184 (25 [22-29])
	PHQ-9	11 (7 [4-12])	6 (5 [2-10])	3 (4 [1-12])	370 (19 [17-21])	257 (18 [16-20])	127 (18 [15-21])
	GAD-7	12 (8 [4-13])	6 (5 [2-11])	1 (1 [0-8])	328 (17 [15-18])	244 (17 [15-19])	110 (16 [13-19])
	PCL-5	4 (3 [1-6])	2 (2 [0-6])	0	196 (10 [9-11])	151 (10 [9-12])	74 (10 [8-13])
	PCS	27 (17 [11-23])	17 (13 [8-21])	7 (11 [5-21])	631 (31 [28-33])	410 (29 [27-32])	189 (29 [24-31])
	MCS	22 (14 [9-20])	11 (9 [5-16])	5 (7 [2-15])	524 (26 [24-28])	354 (26 [24-28])	166 (25 [22-28])

Abbreviations: GOSE = Glasgow Outcome Score Extended. RPQ = Rivermead Post-concussion Symptoms Questionnaire. PHQ-9 = Patient Health Questionnaire 9. GAD-7 = Generalised Anxiety Disorder 7. PCL-5 = Posttraumatic Stress Disorder Checklist 5. PCS = Physical Component Summary. MCS = Mental Component Summary.

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eTable 3a. Correction for multiple comparisons with the use of FDR (false discovery rate) for the comparison of the outcomes of SR-TBI and non-sports TBI for all TBI patients. The table gives the original *P* values from binary logistic regression, the critical *P* values at a 5% FDR rate, and the FDR corrected *P* values.

Rank	Variable	Original *P* value	Critical Value	Adjusted *P* value	Significance
1	RPQ 6	0.001	0.004	0.01	Yes
2	PHQ-9 6	0.002	0.007	0.01	Yes
3	PCL-5 6	0.004	0.01	0.02	Yes
4	PCL-5 3	0.005	0.01	0.02	Yes
5	MCS 6	0.007	0.02	0.02	Yes
6	PCS 3	0.007	0.02	0.02	Yes
7	GAD-7 6	0.01	0.03	0.03	Yes
8	GAD-7 3	0.03	0.03	0.05	Yes
9	GOSE 3	0.05	0.03	0.07	No
10	PCS 6	0.15	0.04	0.21	No
11	GOSE 6	0.17	0.04	0.22	No
12	RPQ 3	0.21	0.04	0.24	No
13	MCS 3	0.32	0.05	0.34	No
14	PHQ-9 3	0.44	0.05	0.44	No

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eTable 3b. Correction for multiple comparisons with the use of FDR (false discovery rate) for the comparison of the outcomes of SR-TBI and non-sports TBI for patients with mTBI. The table gives the original *P* values from binary logistic regression, the critical *P* values at a 5% FDR rate, and the FDR corrected *P* values.

Rank	Variable	Original *P* value	Critical Value	Adjusted *P* value	Significance
1	MCS 6	<.001	0.004	0.008	Yes
2	PHQ-9 6	0.002	0.007	0.01	Yes
3	RPQ 6	0.003	0.01	0.01	Yes
4	PCL-5 6	0.005	0.01	0.02	Yes
5	GAD-7 6	0.007	0.02	0.02	Yes
6	PCL-5 3	0.007	0.02	0.02	Yes
7	PCS 3	0.008	0.03	0.02	Yes
8	GAD-7 3	0.02	0.03	0.04	Yes
9	GOSE 3	0.02	0.03	0.04	Yes
10	PCS 6	0.03	0.04	0.04	Yes
11	RPQ 3	0.12	0.04	0.15	No
12	MCS 3	0.13	0.04	0.15	No
13	GOSE 6	0.32	0.05	0.34	No
14	PHQ-9 3	0.4	0.05	0.4	No

Note. GOSE = Glasgow Outcome Score Extended. RPQ = Rivermead Post-concussion Symptoms Questionnaire. PHQ-9 = Patient Health Questionnaire. GAD-7 = Generalised Anxiety Disorder. PCL-5 = Posttraumatic Stress Disorder Checklist. PCS = Physical Component Summary. MCS = Mental Component Summary.

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eTable 3c. Correction for multiple comparisons with the use of FDR (false discovery rate) for the comparison of outcomes of SR-TBI and non-sports TBI for patients with mTBI and negative CT scan on admission. The table gives the original *P* values from binary logistic regression, the critical *P* values at a 5% FDR rate, and the FDR corrected *P* values.

Rank	Variable	Original *P* value	Critical Value	Adjusted *P* value	Significance
1	MCS 6	0.002	0.005	0.02	Yes
2	RPQ 6	0.006	0.009	0.03	Yes
3	PHQ-9 6	0.006	0.01	0.02	Yes
4	GOSE 3	0.03	0.02	0.07	No
5	PCS 6	0.1	0.02	0.22	No
6	PCS 3	0.1	0.03	0.19	No
7	GAD-7 3	0.17	0.03	0.27	No
8	GOSE 6	0.48	0.04	0.65	No
9	PHQ-9 3	0.53	0.04	0.65	No
10	MCS 3	0.7	0.05	0.77	No
11	RPQ 3	0.88	0.05	0.88	No

Note. GOSE = Glasgow Outcome Score Extended. RPQ = Rivermead Post-concussion Symptoms Questionnaire. PHQ-9 = Patient Health Questionnaire. GAD-7 = Generalised Anxiety Disorder. PCL-5 = Posttraumatic Stress Disorder Checklist. PCS = Physical Component Summary. MCS = Mental Component Summary.

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eResults. Supplementary Analysis

To investigate outcome trends from 3 to 6 months an analysis was conducted of data from patients assessed at both timepoints. The number of patients with outcome information both at 3 and 6 months can be found on Table 2 of the supplementary material. Binary logistic regressions, similar to the ones performed in whole database, were done on those samples.

SR-TBI patients were found to be 1.4[1.003-1.96] times more likely to have returned to normal life at 3 months (P = .05) compared to patient with TBI from other causes, this difference was absent at 6 months post-injury (P = .18; Figure 2). SR-TBI patients were also found to be 2.27 [1.35-3.83] times more likely to have better physical health related quality of life 3 months post-injury (P = .002), but this difference was again absent at 6 months (P = .23). Contrary to that, SR-TBI patients not more likely to have better MCS score 3 months (P = .172) post injury but were 2.23 [1.19-4.16] times more likely to have a better MCS score at 6 months (p = .01).

SR-TBI patients concussion symptom outcomes did not differ from the rest of the sample at the 3 months timepoint (P = .15), however at 6 months SR-TBI patients were 2.46[1.39-4.38] times less likely to have persistent post-concussion symptoms (P=.002).

Concerning mental health outcomes, SR-TBI patients did not differ in depression symptoms at 3 months post injury (P = .45) but were 3.89[1.54-9.83] times less likely to have depressive symptoms compared to the rest of the sample (P = .005). SR-TBI patients were found to be 2.65 [1.19-5.89] and 3.29 [1.30-8.36] times less likely to have anxiety symptoms at 3 and 6 months post-injury respectively. Similarly, SR-TBI patients were found to be 3.49[1.25-9.76] and 6.35[1.53-26.31] times less likely to have PTSD symptoms at 3 and 6 months post-injury respectively.

All P values remained below the chosen level of significance (.05) after correction for multiple comparison, apart from the GOSE score at 3 months.

The number of patients with mTBI and mTBI with negative CT scan with outcome measures both at 3 and 6 months was too small, so analyses on those subsamples were not performed.

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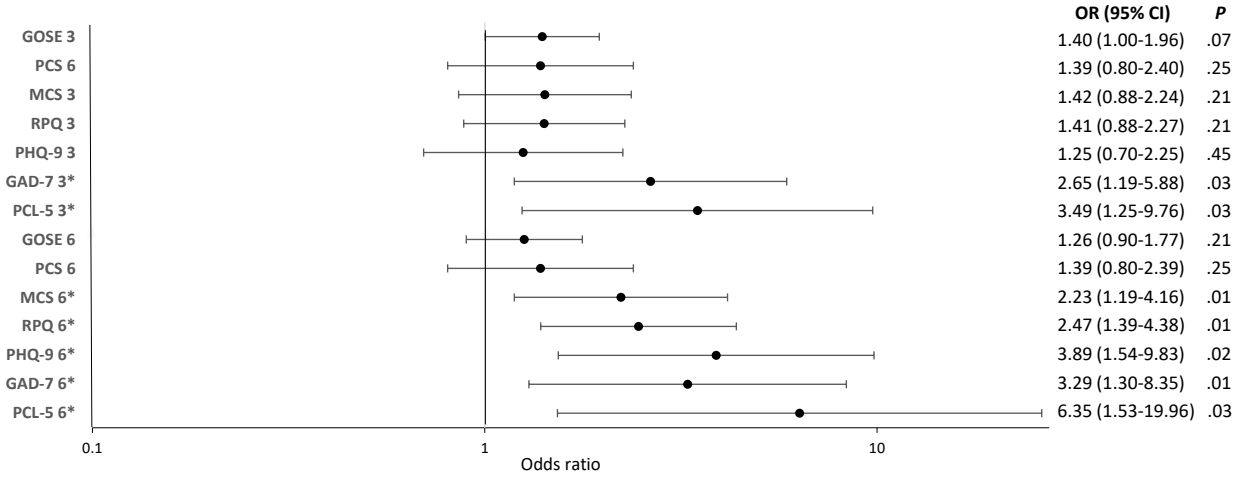
eFigure 2. SR-TBI outcomes odds ratio at 3- and 6-months post-injury (Only for patients with assessments both at 3- and 6-months post-injury).



Note. *****Denotes significant *P* value. GOSE = Glasgow Outcome Score Extended. RPQ = Rivermead Post-concussion Symptoms Questionnaire. PHQ-9 = Patient Health Questionnaire. GAD-7 = Generalised Anxiety Disorder. PCL-5 = Posttraumatic Stress Disorder Checklist. PCS = Physical Component Summary. MCS = Mental Component Summary. Horizontal lines represent 95% confidence intervals. Vertical like represents an odds ratio of 1.

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