



## Cognitive Neuroscience Laboratory

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- the sample).

## Widely Used Clinical Predictors do not Account for Outcome Variability in Mild Traumatic Brain Injury

## 5 Background Re Of the approximately 1.4 million individuals in the US who undergo medical treatment for traumatic brain injury (TBI) each year, more than 1.1 million sustain mild TBI (mTBI). • Outcome following mTBI is variable, with 10-20% of mTBI cases Ge having poor long-term outcome. G • The reasons for this variability remain unknown and the ability to accurately prognosticate mTBI outcome is severely limited. • Studies have not specifically investigated this phenomenon. **Research Participants** An unselected series of head trauma patients were Pc prospectively recruited at Ben Taub General Hospital, a level-1 trauma center in Houston TX. • Criteria for enrollment included: Diagnosis of non-penetrating TBI; 2. Lowest post-resuscitation Glasgow Coma Scale (GCS) > 13; 3. Computed tomography (CT) scan of the brain performed < 24 hours post-injury, No surgery under general anesthesia during hospitalization; 5. Arrival to the hospital < 24 hours post-injury; Blood alcohol level < 200 mg/dL; Pa 7. Age > 16 years; 8. Fluent in English or Spanish; 9. Residing in the hospital catchment area, Harris County, TX; • Re 10. Not an undocumented resident, incarcerated, homeless, or sig on active military service; 11. No spinal cord injury; 12. No prior TBI requiring hospitalization; 13. No history of substance dependence, mental retardation, psychotic disorders, receiving treatment for depression at the time of injury, or other CNS disturbance; 14. No other pre-existing condition preventing standard administration and interpretation of the outcome measures. Procedure Resilience Participants were recruited in the EC or during their acute hospitalization. • Diagnosis of TBI was made by EC trauma physicians and GCS ratings were made by EC trauma physicians and/or staff; Modified ISS ratings were made by an AIS-certified research nurse based on thorough medical record review; • Evaluations at 3 (± 1 month) after injury included face-to-face interviews; Only the three-month data are presented here. **Data Analysis Design/Methods** 6 Conclusions We analyzed data from subjects with mTBI with negative head CT findings at 24 hours post-injury and without sources of secondary gain at follow-up (litigation or compensation). • We compared two groups based on results of the Glasgow Outcome Scale-Extended (GOS-E) assessed at 3 months postinjury: Upper Good Recovery (UGR; n = 116; 57.1% of the sample) and Lower Moderate Disability (LMD; n = 21; 10.3% of

Variable	Upper Good Recovery (n = 116.)	Lower Moderate Disability (n = 21)	Statistic
e (years)	28.0 (9.8)	32.9 (10.0)	F = 4.3, p = .04
nder	M 75.9%	M 57.1%	$X^2 = 3.16, p = .08$
odified ISS	3.6 (4.8)	3.0 (4.3)	F = 0.38, p = .54
S in ER	14.9 (0.4)	14.7 (0.6)	F = 2.52, p = .11
echanism of Injury	MVA (56.0%) Auto/Ped (2.6%) Auto/Bicycle (0.9%) Assault (24.1%) Fall/Jump (8.6%) Sports (7.8%)	MVA (81.0%) Auto/Ped (0%) Auto/Bicycle (0%) Assault (14.3%) Fall/Jump (4.7%) Sports (0%)	X <sup>2</sup> = 5.29, <i>p</i> = .38
ood Alcohol in ER (mg/dL)	0.0 (0.1)	0.0 (0.1)	F = 0.07, <i>p</i> = .79
sitive ER Toxicology Screen	10.6%	10.5%	$X^2 = .0002, p = .68$
ucation (years completed)	11.8 (2.4)	9.4 (3.4)	F = 15.38, <i>p</i> < .0001
cupation Level	Professional (8.6%) Managerial (14.6%) Craftsmen (7.8%) Unemployed (31.0%) Semiskilled (23.3%) Unskilled (14.7%)	Professional (4.8%) Managerial (0%) Craftsmen (9.5%) Unemployed (23.8%) Semiskilled (28.6%) Unskilled (33.3%)	X <sup>2</sup> = 7.53, <i>p</i> = .18
story of Premorbid Alcohol Abuse	20.7%	38.1%	$X^2 = 3.0, p = .08$
story of Premorbid Substance Abuse	0.86%	4.76%	X <sup>2</sup> = 1.88, <i>p</i> = .17
st Major Depressive Episode	6.9%	38.1%	X <sup>2</sup> = 16.77, <i>p</i> < .0001
story of Premorbid Psychiatric Problems	11.2%	52.4%	X <sup>2</sup> = 20.8, <i>p</i> < .0001



This analysis demonstrates that some of the most widely used predictors of outcome following mTBI account for only a small fraction of the outcome variance.

• Recent studies have suggested that advanced imaging may have some prognostic value.

• Further studies are needed to dissect the factors associated with outcome variability and to develop more effective prognostic tools and therapies in mTBI.

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Known Variance	
Age	4.5%
Education	7.0%
Past MDE	6.0%
Premorbid Psych	7.5%
GCS in ER	4.0%