

*Translational Research Center for TBI and Stress Disorders
“TRACTS”*

VA Boston Healthcare System

2009-2019:

*A VA Rehab R & D Center of Excellence Devoted to the Development of Innovative Methods to
Diagnose and Treat
OEF/OIF/OND
Veterans with Co-Morbid Deployment Related Trauma*

**THE FOLLOWING PAGES CONTAIN A SNAPSHOT OF THE CHARACTERISTICS OF
THE TRACTS LONGITUDINAL STUDY AND CORE B DATASET AS OF FEBRUARY 2016.
NOTE THAT SOME STATISTICS HAVE NOT BEEN UPDATED TO REPRESENT THE COMPLETE
CURRENT SAMPLE.**

**FOR A LISTING OF AVAILABLE PUBLICATIONS USING THE TRACTS COHORT PLEASE SEE :
<http://heartbrain.hms.harvard.edu/publications>**



TRACTS Assessment Core

Medical/ Biological	Neuropsych Domains	Affective/ Psychosocial	Blast/TBI	Neuroanatomy S/F MRI
Blood Chemistry	Simple/Divided Attention	PTSD: CAPS & PCL-C	Boston Assessment of TBI-Lifetime	Cortical Volume
GWAS	Information Processing Speed	DSM-IV AXIS I: SCID	Ohio State University TBI ID	Cortical Thickness
Neuro-steroid	Executive Function	Traumatic Life Events Questionnaire	Neurobehavioral Symptom Inventory	Diffusion Tensor
	Declarative/ Procedural Memory	Deployment Risk & Resiliency Inventory		Resting-State Networks
	Pre-morbid Function	Depression, Anxiety & Stress Scale-21		Functional Connectivity
	Perception	Pittsburg Sleep Quality Index		Task-Based fMRI
	Symptom Validity	McGill Pain Questionnaire		
	Psychomotor Speed	Alcohol, Nicotine		
		Sickness Impact Profile		

The TRACTS Data Repository contains over 2000 variables and may be accessible for research by qualified and credentialed investigators. For further information please contact: mrfitz.va@gmail.com

TRACTS Assessment Core

Medical/Biological	Neuropsych Domains	Affective/ Psychosocial	Blast/TBI	Neuroanatomy S/F MRI
Blood Chemistry	Simple/Divided Attention	As of 2/16: Max=432	Boston Assessment of TBI-Lifetime	Cortical Volume
GWAS	Information Processing Speed	DSM-IV AXIS I SCID	Ohio State University TBI ID	Cortical Thickness
Neuro-steroid	Executive Function	Certified Data Time 1=450	Behavioral Inventory	Diffusion Tensor
	Developmental Procedural Mem	Deployment Risk & Stress Scale-21		Resting-State Networks
	Perception	Pittsburg Sleep Quality Index		Functional Connectivity
	Symptom Validity	Projected Time 1 Enrollment (2014-2019)=750 Projected Time 2 Enrollment=500		Task-Based fMRI
	Psychomotor Speed	Alcohol, Nicotine		
		Sickness Impact Profile		

Characterization of the TRACTS Cohort (n=255)

Demographics & Service Information

Demographics	TRACTS	VHA Veterans (n=771,874)
Males	227 (89%)	88%
Education	13.9 ± 1.9	
Race		
White	178 (70%)	80.8%
Black	25 (10%)	11.7%
Hispanic	40 (16%)	6.3%
Other	7 (2%)	5.15%
Unknown/Missing	5 (2%)	
Birth Cohort		
1980-1995	56.7	46.8
1970-1979	22.9	25.7
1960-1969	18	20.5
1950-1959	2.1	6
1926-1949	0.3	0.9

Characterization of the TRACTS Cohort (n=255)

Demographics & Service Information

Service Branch	TRACTS	VHA Veterans (n=771,874)
National Guard/Reserve	51.9%	44.2%
Navy	3.9%	13.2%
Marines	18%	13.6%
Air Force	11.3%	12.5%
Army	66.4%	60.5%
OEI/OIF/OND Deployments		
Number	1.4 ± 0.7	
Duration (months)	14.3 ± 8.5	
Combat Exposure	15.8 ± 11.8	

The Boston Assessment of Traumatic Brain Injury-Lifetime (BAT-L) Semi-structured Interview: Preliminary Evidence of Research Utility and Validity

J Head Trauma Rehabil 2013

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Developed by TRACTS in conjunction
with the Neuropsychology & Polytrauma
clinical services at VA Boston

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The Boston Assessment of Traumatic Brain Injury–Lifetime (BAT-L) Semistructured Interview: Evidence of Research Utility and Validity

Catherine Brawn Fortier, PhD; Melissa M. Amick, PhD; Laura Grande, PhD;
Susan McGlynn, PhD; Alexandra Kenna, PhD; Lindsay Morra, BA; Alexandra Clark, BA;
William P. Milberg, PhD; Regina E. McGlinchey, PhD

Objective: Report the prevalence of lifetime and military-related traumatic brain injuries (TBIs) in Operation Enduring Freedom and Operation Iraqi Freedom (OEF/OIF) veterans and validate the Boston Assessment of TBI–Lifetime (BAT-L). **Setting:** The BAT-L is the first validated, postmortem, semistructured clinical interview to characterize head injuries and diagnose TBIs throughout the life span. **Participants:** Community-dwelling convenience sample of 131 OEF/OIF veterans. **Design:** TBI criteria (alteration of mental status, posttraumatic amnesia, and loss of consciousness) were evaluated for all possible TBIs, including a novel evaluation of blast exposure. **Main Measures:** BAT-L, Ohio State University TBI Identification Method (OSU-TBI-ID). **Results:** About 67% of veterans incurred a TBI in their lifetime. Almost 15% of veterans experienced at least 1 military-related TBI; all were mild in severity, 40% of them were due to blast, 50% were due to some other (ie, blunt) mechanism, and 10% were due to both types of injuries. Predeployment TBIs were frequent (45% of veterans). There was strong correspondence between the BAT-L and the OSU-TBI-ID (Cohen $\kappa = 0.89$; Kendall $\tau\text{-b} = 0.95$). Interrater reliability of the BAT-L was strong ($\kappa > 0.80$). **Conclusions:** The BAT-L is a valid instrument with which to assess TBI across a service member's lifetime and captures the varied and complex nature of brain injuries across OEF/OIF veterans' life span. **Key words:** assessment, blast, OEF/OIF, traumatic brain injury (TBI), veterans

MILD TRAUMATIC BRAIN INJURY (mTBI) is the so-called signature injury of Operation

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To download the full BAT-L, semi-structured clinical interview go to: <http://www.headbrain.com/>.

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Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.headtraumarehab.com).

The authors declare no conflict of interest.

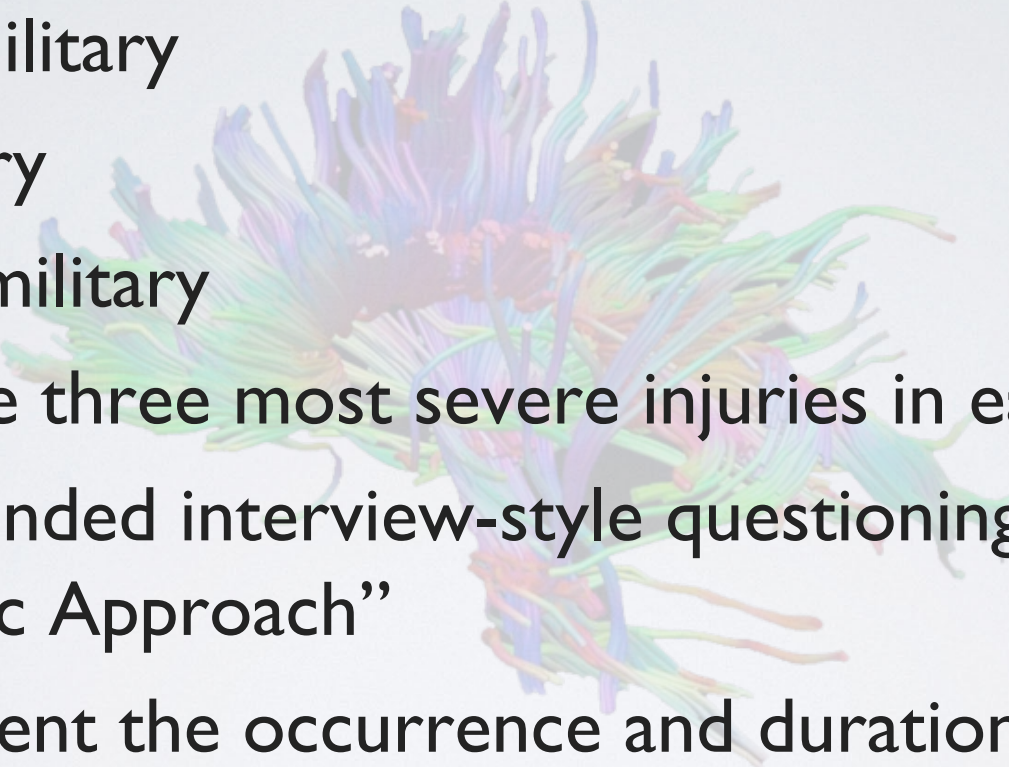
Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), yet its identification and diagnosis are controversial and fraught with challenges. Diagnosis of military-related mTBI in OEF/OIF veterans is complex and unique from the diagnosis of civilian-acquired brain injuries in a number of ways. This is due to the novel mechanism of injury (exposure to blast(s) such as an improvised explosive device), the frequent co-occurrence of head injury and psychological trauma during the chaos of combat that make the determination of altered mental status (AMS) difficult, and the difficulty obtaining in-theater documentation of symptoms at the time of injury for determining the presence or absence of mTBI. Although in-theater documentation of injuries is improving in more recent years, for the majority of OEF/OIF veterans, injuries were

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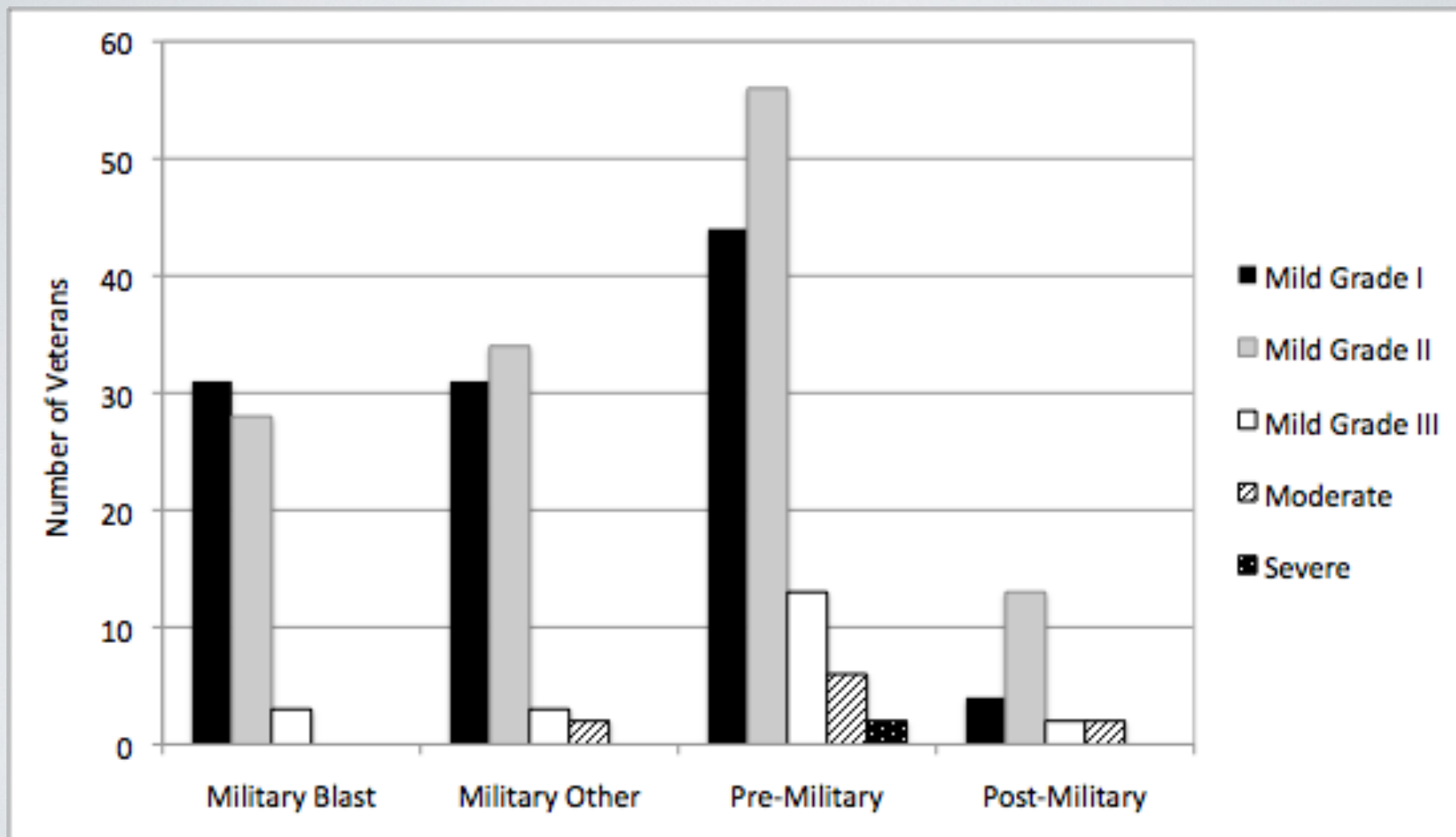
BAT-L Assessment

- TBI is assessed during three time epochs:
 - Pre-military
 - Military
 - Post-military
 - Evaluate three most severe injuries in each epoch
 - Open-ended interview-style questioning; “Forensic Approach”
 - Document the occurrence and duration of neurobehavioral symptoms (LOC, PTA, AMS) following each injury recorded.
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Blast Exposures TRACTS Cohort (n=255)

	< 10 meters	11-25 meters	26-100 meters	Total Blast Exposures <100 meters
Number of Service Members Exposed	100 (39%)	102 (40%)	181 (71%)	200 (78%)
Mean Blasts per Service Member	2.80 (26.15%)	2.83 (14.26%)	20 (80.70%)	26.62 (97.74%)
Median Blasts per Service Member	0	0	2	3
Range of Blasts per Service Member	0-416	0-204	0-721	0-721

TBI's over the Lifetime for the TRACTS Cohort (n=255)



Demographics	n	Total (n=410)	Military TBI (n=196)	No Military TBI (n=214)	P-value
Age, mean (SD)	410	32.12 (8.46)	31.92 (8.04)	32.31 (8.85)	0.6460
Males, No. (%)	410	373 (91.0%)	184 (93.9%)	189 (88.3%)	0.0497
Education, mean (SD)	410	13.80 (1.88)	13.63 (1.81)	13.95 (1.93)	0.0838
Unit Type, No. (%)	410				0.0004
Active Duty		205 (50%)	116 (59.2%)	89 (41.6%)	
Reserve/Guard		205 (50%)	80 (40.8%)	125 (58.4%)	
Service Branch, No. (%)	394				0.0177
Army		255 (64.7%)	120 (62.5%)	135 (66.8%)	
Navy		12 (3.1%)	8 (4.2%)	4 (2.0%)	
Marines		101 (25.6%)	58 (30.2%)	43 (21.3%)	
Air Force		25 (6.4%)	6 (3.1%)	19 (9.4%)	
Coast Guard		1 (0.3%)	0 (0%)	1 (0.5%)	
OEF/OIF/OND Deployments					
Number, mean (SD)	410	1.48 ± 1.01	1.53 ± 0.87	1.43 ± 1.13	0.3101
Duration (months), mean (SD)	410	14.37 ± 8.50	15.39 ± 9.55	13.43 ± 7.32	0.0215
Combat Exposure, mean (SD)	386	17.49 ± 12.14	22.56 ± 12.14	13.01 ± 10.26	<0.0001

Psychiatric & Behavioral Conditions	n	Total (n=410)	Military TBI (n=196)	No Military TBI (n=214)	P-value
PTSD, No. (%)	410	262 (63.9%)	157 (80.1%)	105 (49.1%)	<0.0001
Depressive Disorders, No. (%)	410	113 (27.6%)	69 (35.2%)	44 (20.6%)	0.0009
Major Depressive Disorder, No. (%)	410	102 (24.9%)	63 (32.1%)	39 (18.2%)	0.0011
Other Depressive Disorder, No. (%)	410	12 (2.9%)	7 (3.6%)	5 (2.3%)	0.4587
Anxiety Disorder, No. (%)	409	87 (21.2%)	44 (22.5%)	43 (20.1%)	0.5601
Panic Disorder, No. (%)	409	35 (8.6%)	24 (12.2%)	11 (5.2%)	0.0105
Social Phobia, No. (%)	409	26 (6.4%)	11 (5.6%)	15 (7.0%)	0.5537
Generalized Anxiety Disorder, No. (%)	409	33 (8.1%)	16 (8.2%)	17 (8.0%)	0.9462
Other Anxiety Disorder, No. (%)	409	21 (5.1%)	11 (5.6%)	10 (4.7%)	0.6745
Substance Use Disorders, No. (%)	410	65 (15.9%)	37 (18.9%)	28 (13.1%)	0.1086
Alcohol Abuse/Dependence, No. (%)	410	55 (13.5%)	31 (15.8%)	24 (11.3%)	0.1780
Other Abuse/Dependence, No. (%)	410	16 (3.9%)	8 (4.1%)	8 (3.7%)	0.8577
Pain, No. (%)	372	263 (70.7%)	145 (83.3%)	118 (59.6%)	0.0005
Sleep Disturbance, No. (%)	389	309 (79.4%)	160 (88.4%)	149 (71.6%)	<0.0001
Number of Psychiatric & Behavioral Conditions, mean (SD)	367	2.68 ± 1.46	3.12 ± 1.31	2.27 ± 1.48	<0.0001
3+ Comorbidities	367	212 (57.8%)	128 (75.3%)	84 (42.6%)	<0.0001