



Advances in TBI Care resulting from VA and TBI Model Systems Collaboration

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- The views, opinions, and/or findings contained in this article are those of the authors and should not be construed as an official position by the Department of Defense, Department of Veterans Affairs, or any other federal agency, policy or decision unless so designated by other official documentation.



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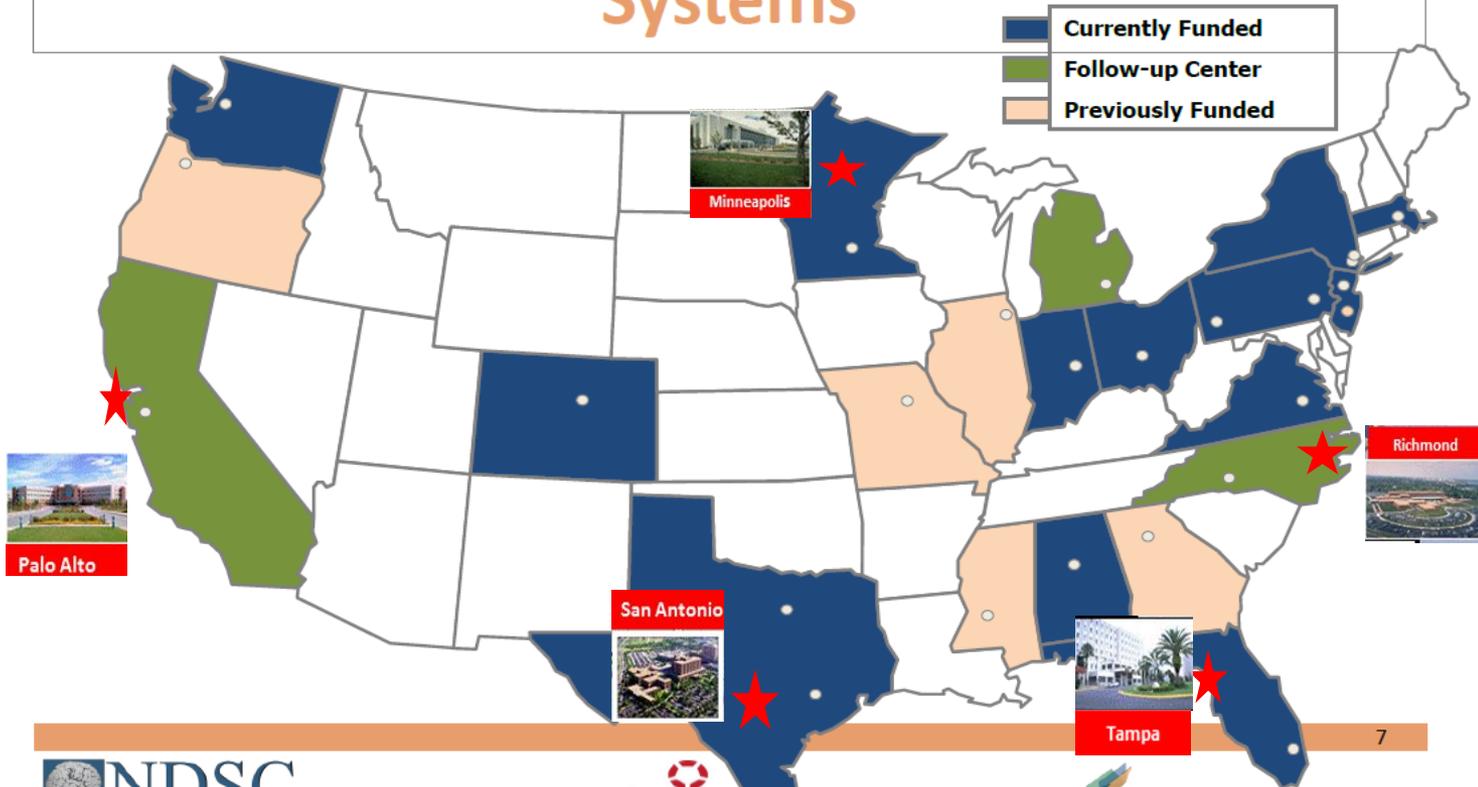
What is the TBI Model System (TBIMS) Study?

- The National Institute on Disability, Independent Living and Rehabilitation Research (NIDILRR) TBI Model System (TBIMS) program, created in 1987 is a prospective, longitudinal, multi-center study which examines TBI recovery and outcomes following coordinated acute medical care and inpatient rehabilitation.
 - 16 Funded Centers, 1 National Data Center, 1 Knowledge Translation Center
 - >15,000 participants enrolled
 - Conducting 25-year post-injury follow-ups
 - Elaborate data collection policies, infrastructure, and quality guidelines, Twice Annual Meetings in DC
 - Special Interest Groups (e.g., Sleep, PCORI, DOC, Aging), Committees (Research, Data, Knowledge Translation, Planning, Executive), and Modules.
- Goal: Conduct research that contributes to evidence-based rehabilitation interventions and practice guidelines that improve the lives of individuals with TBI.
- VA TBIMS Primary Objective:
 - Establish a longitudinal database of active duty military and veteran rehabilitation outcomes from TBI during acute and chronic stages of recovery.
 - Data collection ensued in 4th quarter of 2009



Where are the 21 NIDILRR and VA TBIMS Sites?

Current Traumatic Brain Injury Model Systems





Variable Categories within the VA TBIMS

Form I – 398 Variables (Pre-injury, Acute & Rehabilitation Care)

- Demographics
- Premorbid Functioning
- Injury Characteristics (mechanism and multiple indices of severity)
- Comorbidities
- Hospital Course
- Mortality
- Rehabilitation Outcomes

Lamberty GJ, Nakase-Richardson R, Farrell-Carnahan L, McGarity S, Bidelsbach D, Harrison-Felix C, Cifu DX. Development of a TBI Model Systems within the VA Polytrauma System of Care. *J Head Trauma Rehabil*, 2014;29(3): E1-E7.

Form II – 246 Variables (Post-Injury Annual Follow-Up: 1, 2, 5, 10 etc)

- Outcome
 - Mortality
 - Rehabilitation (FIM, DRS, GOS-E, Part-O)
 - Quality of Life (SWLS)
 - Health/Re-hospitalization
- Psychological
 - PHQ-9, GAD-7, PCL-C, NSI
 - Substance Use
 - Treatment Utilization
- Updated Demographics (e.g., zip code)
- Socioeconomic
 - Income/Employment/School
 - Transportation



TBIMS Progress

- Enrollment, $N > 1000$
- Publications, $N = 19$ (*published, in press*)
- Presentations, $N = 96$
- Conference Awards, $N = 5$
 - *Most Early Career Mentees*
- Informed Congressional Reports, $N = 2$
- Leveraged, *New Funding = 4*



Leveraged Funding

	Award or Grant Title
PCORI – R1511-3305:	Comparative Effectiveness of Sleep Apnea Assessment Strategies to Maximize TBI Rehabilitation Outcome(C-SAS)
DVBIC-W91Y TZ-13-C-0015	Improved Understanding of Medical And Psychological Needs (I-MAP) in Veterans and Service Members with Chronic TBI
VA HSRD; SDR 13-228	Veterans with mTBI: Barriers to Community Reintegration
VA RR&D; 1 I21 RX001923-01A1	Sleep-EEG Predictors of Functional Outcome after TBI



SEC. 721. LONGITUDINAL STUDY ON TRAUMATIC BRAIN INJURY (Mandated by Congress)

Improved Understanding of Medical and Psychological Needs in Chronic TBI *IMAP*

- DURATION.—The study required by subsection (a) shall be conducted for a period of 15 years.
- (c) ELEMENTS.—The study required by subsection (a) shall specifically address the following:
 - (1) The long-term physical and mental health effects
 - (2) The health care, mental health care, and rehabilitation needs after the completion of inpatient treatment
 - (3) The type and availability of long-term care rehabilitation programs and services ...including community-based programs and services and in-home programs and services.
 - (4) The effect on family members of a member incurring such an injury.



I-MAP and the Relationship to the Existing TBIMS



I-MAP is a 5-year, prospective, multi-center mixed methods study which will capitalize on the existing infrastructure of the VA TBI Model Systems Program.

Phase 1:

- Analyze VA TBIMS to address military healthcare needs
 - JHTR Special Issue

Phase 2:

- Add new study measures to TBI Model System infrastructure
 - NHANES Comorbidity
 - Rehabilitation Needs Survey
 - Craig Hospital Inventory of Environmental Factors
 - Family Needs Questionnaire
 - Patient Global Impression of Change
 - Healthcare Services

Phase 3:

- Qualitative data collection
 - Family and Veteran Perceived Rehabilitation Needs

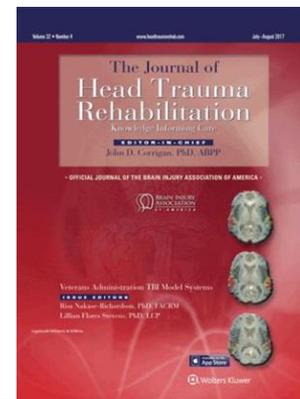
Injury Characterization and Outcome Measures Collected in the VA TBIMS Program of Research.			
Variable	Form 1 (Acute Injury and Hospitalization)	Form 2 (Annual Follow-Up 1, 2, 5 Years Post-Injury)	NINDS Common Data Element
Glasgow Coma Scale	X	-	X
Duration of Unconsciousness (i.e., time until following commands)	X		
Duration of Post-Traumatic Amnesia (i.e., time until oriented)	X	-	X
Functional Independence Measure	X ¹	X	X
Disability Rating Scale	X ¹	X	X
Employment Status Variables	X ²	X ³	X
Neuropsychological Testing	X		X (portions)
Neurobehavioral Symptom Inventory	X	X	X
PTSD Checklist-C	X	X	X
Mayo-Portland Adaptability Inventory-4	X ⁴	-	X
Treatment for Psychiatric Status (Suicide, Depression, PTSD)	X ²	X ³	
Participation Assessment with Recombined Tools (PART) - Objective	-	X	X
Satisfaction With Life Scale	-	X	X
Patient Health Questionnaire-9	-	X	X
Generalized Anxiety Disorder Scale-7	-	X	-
Supervision Rating Scale	-	X	-
Glasgow Outcome Scale - Extended	-	X	X
OSU TBI-ID Short Form	X ²	X	X
Living Situation	X ²	X	X
Transportation Status	-	X	-
Death	X	X	X

1=Admission and Discharge Ratings Obtained. 2= Pre-morbid Information Obtained. 3=Status Since Injury or Last Follow-Up Obtained. 4=Obtained for Patients Transferred to Post-Acute Community Re-integration Programming in VHA.



Comparison of the VA and NIDILRR TBI Model System Cohorts

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- Recent studies highlight representativeness of the NIDILRR TBIMS to US population (age 18-61) receiving inpatient rehabilitation
- TBI Rehabilitation research informed by NIDILRR TBIMS studies (<830 to date)
- Compare demographic, injury, and outcomes across NIDILRR and VA TBIMS Cohorts at Enrollment (Rehab)





Differences in Inclusion/Exclusion Criteria

Table 1. Summary of Inclusion and Exclusion criteria for NIDILRR and VA. TBIMS

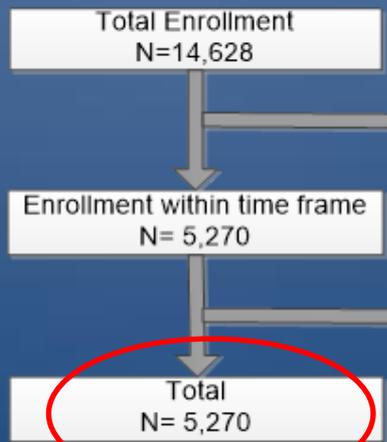
	NIDILRR	VA
Inclusion	Moderate to Severe TBI	Any severity level
	> 16 years	> 18 years
	Presented to the TBIMS center within 72-hours of injury	No time constraints to PRC presentation
	Received both acute care and inpatient rehabilitation at the TBIMS center	Presented to a VA PRC for comprehensive inpatient TBI rehabilitation
Exclusion	72-hour or greater absence from the TBIMS center prior to rehabilitation admission	Already being enrolled in TBIMS
	In law enforcement custody	



VA Sample, N=550

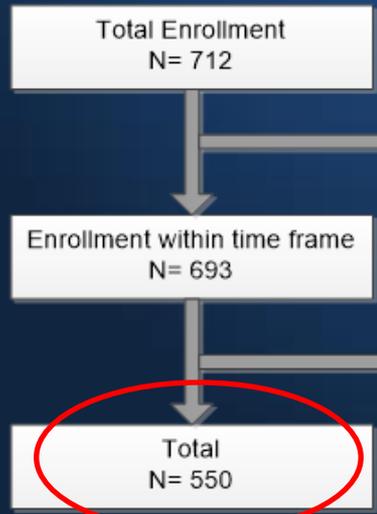
NIDILRR Sample, N=5270

NIDILRR enrollment



Exclude:
Enrolled (rehab admission date) outside August 1, 2009 and July 31, 2015, N= 9,358

Exclude:
Enrolled (rehab admission date) after one year post injury, N= 0



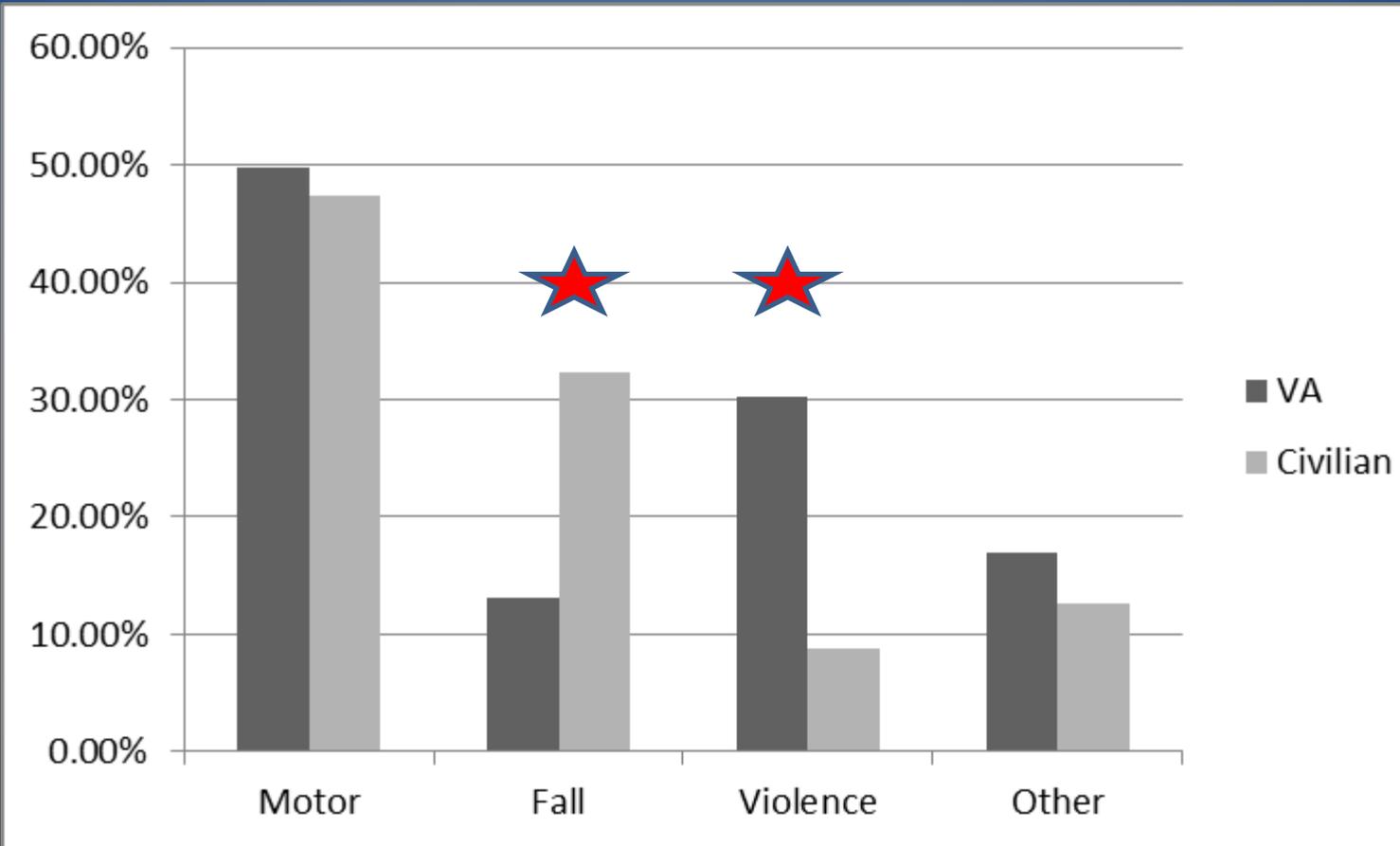
Exclude:
Enrolled (PRC admission date) outside August 1, 2009 and July 31, 2015, N= 19

Exclude:
Enrolled (PRC admission date) after one year post injury, N= 143

VA enrollment



Etiology Comparison





Magnitude of Differences Ratings Based on Group Mean Difference

Rating	Continuous Data	Categorical Data
Insignificant (None)	<25% of 1 SD of civilian	< 5%
Minimal (Minor)	25-49.99% of 1 SD	5-9.99%
Important (Imp)	>50% of 1 SD	>10%

Corrigan JD, Cuthbert JP, Whiteneck GG, Dijkers MP, Coronado V, Heinemann AW, Harrison-Felix C, Graham JE. Representativeness of the traumatic brain injury model systems national database. J Head Trauma Rehabil 2012, 27:391-403.



Number of Different Ratings Among Comparisons Made

- Magnitude of differences varied by mechanism of injury

Group	% Different	Imp	Minor
Overall	76%	N=18	N=8
MVC	74%	N=15	N=10
Fall	74%	N=21	N=4
Violence	76%	N=22	N=4



Demographic Differences

	Significance Rating			
Demographics	Full Sample	MVC	Fall	Violent
Age (Years)	Minor-C	None	Imp-V	Imp-V
Gender: Male	Imp-V	Imp-V	Imp-V	Imp-V
Race / Ethnicity				
White	None	None	Imp-C	Imp-V
Black or African American	Minor-C	Minor-C	None	Imp-C
Hispanic	None	None	None	Minor-V
Other	Minor-V	Minor-V	Imp-V	None
Marital Status: Married	None	Minor-V	None	Imp-V
Education Categories				
< High school diploma	Imp-C	Imp-C	Imp-C	Imp-C
High school diploma	Imp-V	Minor-V	None	Imp-V
> High school diploma	Minor-V	Minor-V	None	Imp-V



Premorbid Status

Pre-Morbid Status	Full Sample	MVC	Fall	Violent
Employed/Student	Imp-V	None	Imp-V	Imp-V
Retired (Age or Disability)	Imp-C	None	Imp-C	None
Other	Minor-C	Minor-C	Minor-C	Imp-C
Served in the Military	Imp-V	Imp-V	Imp-V	Imp-V
Years in Active Duty*	Minor-V	Minor-V	Minor-C	None
Deployed in Combat Zone*	Imp-V	Imp-V	Imp-V	Imp-V



Pre-Injury Behavioral Health Status

Behavioral Health	Full Sample	MVC	Fall	Violent
Mental Health Utilization: Ever	Imp-V	Imp-V	Imp-V	None
Use of Illicit/Non-Prescription Drugs	Minor-C	Minor-C	None	Imp-C
Drinking Category				
Abstaining/Light	None	Minor-C	Imp-C	Imp-V
Moderate	None	Imp-V	Imp-V	Imp-C
Heavy	None	None	None	Imp-C



Injury Characteristics

Injury Characteristics	Full Sample	MVC	Fall	Violent
GCS, quartiles	None	None	Minor-V	None
Time to Follow Commands, Days	Minor-V	None	None	None
Duration of PTA, Days	Imp-V	Imp-V	Minor-C	None
Duration of PTA, Days (censored)	None	None	Minor-C	Minor-C
TSI to Inpatient Rehab, Days	Imp-V	Imp-V	Imp-C	Imp-C



Conclusions

- Different mechanisms of injury across cohorts
 - Important from a prognosis standpoint in predicting outcome
- Important and minor differences varied across etiologies across most comparisons
- These differences may contribute to different outcomes across cohorts
- 13% (N=639) of NIDILRR participants were Veterans (underestimate) giving a more comprehensive review of Veterans using civilian healthcare
- Foundational base for evaluating generalizability of scientific findings across cohorts



VA TBIMS Health Outcome Papers

- Tran J, Hammond F, Dams-O'Connor K, Tang X, Eapen B, McCarthy M, Nakase-Richardson R. Rehospitalization in the First Year following Veteran and Service Member TBI: A VA TBI Model Systems Study. *J Head Trauma Rehabil*, 2017; 32(4): 264-270.
- Holcomb EM, Schwartz DJ, McCarthy M, Thomas B, Barnett SD, Nakase-Richardson R. Incidence, characterization, and predictors of sleep apnea in consecutive brain injury rehabilitation admissions. *J Head Trauma Rehabil*. 2016;31(2):82-100.
- Farrell-Carnahan L, Barnett S, Lamberty G, Hammond F, Kretzmer TS, Franke LM, Geiss M, Howe L, Nakase-Richardson, R. Insomnia symptoms and behavioral health symptoms in veterans 1 year after traumatic brain injury. *Brain Inj*. 2015;29(12):1400-8.
- Towns SJ, Zeitzer J, Kamper J, Holcomb E, Silva MA, Schwartz DJ, Nakase-Richardson R. Implementation of actigraphy in acute traumatic brain injury neurorehabilitation admissions: A veterans administration TBI model systems feasibility study. *Phys Med Rehabil*. 2016;8(11):1046-1054.



Psychological Health Outcomes

- Gause LR, Finn JA, Lamberty GJ, Tang X, Stevens LF, Eapen BC, Nakase-Richardson R. Predictors of satisfaction with life in Veterans after traumatic brain injury: A VA TBI Model System study. *J Head Trauma Rehabil*, 2017; 32(4): 255-263.
- Belanger HG, Silva MA, Donnell AJ, Mckenzie-Hartman T, Lamberty GJ, Vanderploeg RD. Utility of the Neurobehavioral Symptom Inventory as an outcome measure: A VA TBI Model Systems Study. *J Head Trauma Rehabil*. 2017; 32(1):46-54.

Under Review

- Finn JA, Lamberty GJ, Stevens L, Kretzmer T, Brenner L. Post-rehabilitation mental health treatment-seeking in veterans with traumatic brain injury: A VA TBI Model Systems study. *J Head Trauma Rehabil*, Accepted pending minor revisions
- Dreer LE, Tang X, Zafonte R, Nakase-Richardson R, Cox MK, Finn J, Pugh MJ, Bailey E. Suicide and traumatic brain injury: a review by clinical researchers from the National Institute for Disability and Independent Living Rehabilitation Research (NIDILRR) and Veterans Health Administration Traumatic Brain Injury Model Systems. *Curr Opin Psychol*. Under Review



Rehospitalization in the First Year Following Veteran and Service Member TBI: A VA TBI Model Systems Study

Johanna Tran, MD; Flora Hammond, MD; Kristen Dams-O'Connor, PhD; Xinyu Tang, PhD; Blessen Eapen, MD; Marissa McCarthy, MD; Risa Nakase-Richardson, PhD

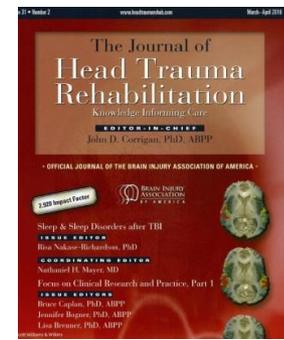


TABLE 1 *Examples for rehospitalization from the VA TBIMS National Data and Statistical Center*

Category	Example
Rehabilitation (inpatient)	Rehabilitation, community reintegration treatment within the residential VA Polytrauma Transitional Rehabilitation Programs
Seizures	Seizures
Neurologic disorder (nonseizure)	Repeat traumatic brain injury; shunt-related; headaches
Psychiatric	Behavior modification; violent outburst; depression; inpatient chemical dependency unit
Infectious	Blood infection; high fever; lung infection; meningitis; upper respiratory tract infection
Orthopedic and reconstructive surgery	Cranioplasty; removal of hardware; tracheostomy removal; feeding tube displacement; neck fusion; fracture; rotator cuff repair; plastic surgery eye surgery; ear surgery
General health maintenance/OB/GYN	Medical—asthma, acute kidney injury, acute myocardial infarction, dehydration, diarrhea, deep vein thrombosis, fecal impaction/bowel obstruction, gastrointestinal bleeding, respiratory distress, urologic Surgical—abdominal surgery, including cholecystectomy, hernia repair; heart surgery; OB/GYN: childbirth, hysterectomy



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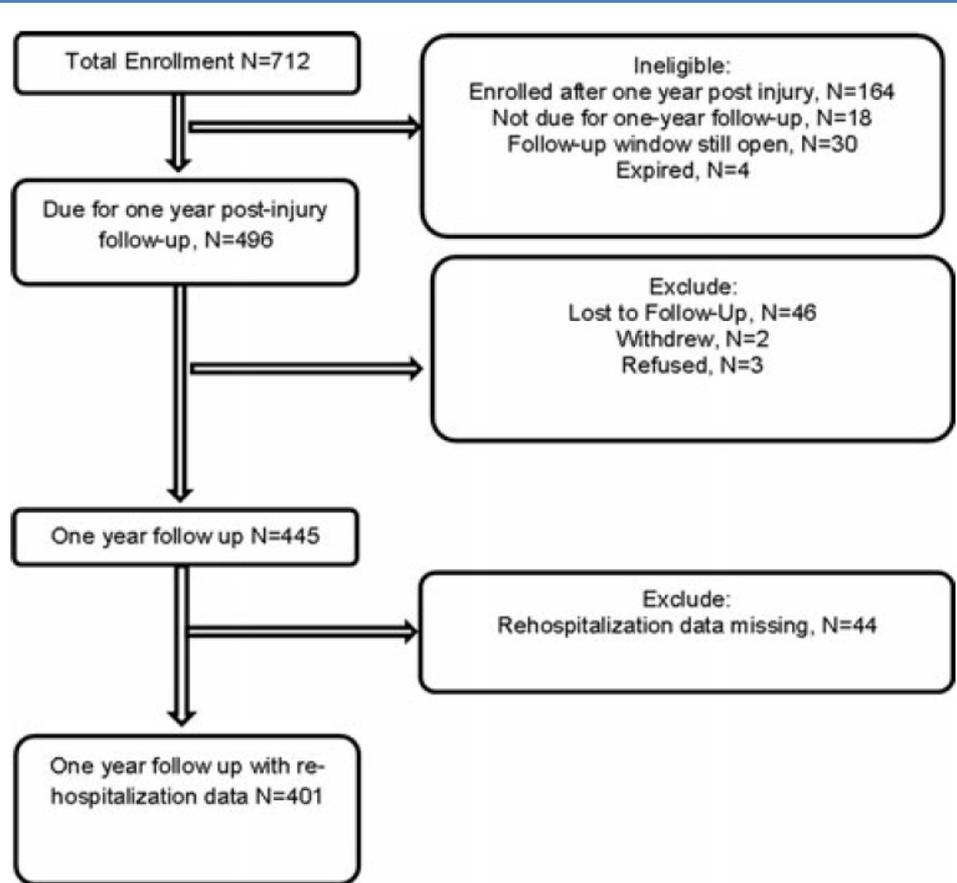
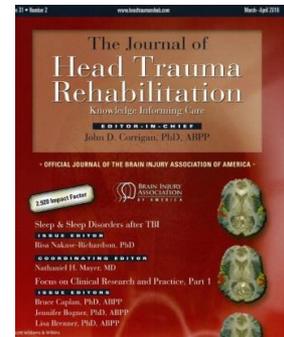


Figure 1. Flowchart describing study sample.



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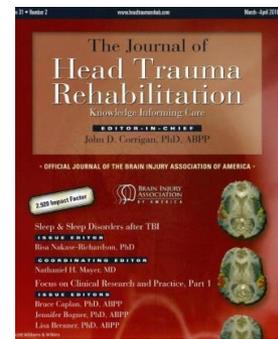


TABLE 2 *Summary of reasons for all rehospitalizations in descending order*

Reason	Count	%
Rehabilitation: inpatient	85	33
Other: not specified elsewhere	68	26
Orthopedic	26	10
Seizures	21	8
Infectious	20	8
Psychiatric	18	7
General health maintenance or OB/GYN	14	5
Neurologic disorder: nonseizure	7	3
Major amputation: mid-hand/mid-foot or greater	0	0
Total	259	100

Abbreviation: OB/GYN, obstetric/gynecologic.



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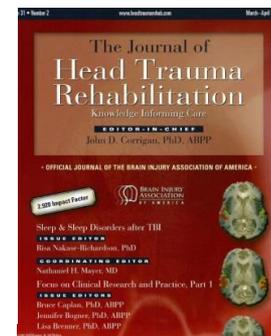


TABLE 4 Summary of study variables by rehospitalization status^a

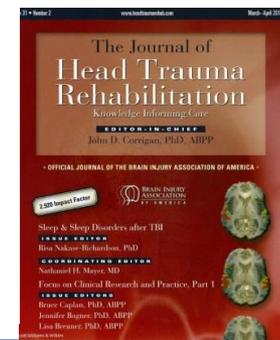
Covariates	N	Full sample (N = 401)	Rehospitalization (N = 401)		Rehospitalization yes (N = 164)		Significance of comparisons	
			No (N = 237)	Yes (N = 164)	1 (N = 115)	≥2 (N = 49)	P ^b	P ^c
Age, y	401	23.0; 28.0; 43.0	23.0; 28.0; 43.0	23.0; 27.0; 42.2	23.0; 28.0; 40.5	23.0; 26.0; 44.0	.951	.958
Male	400	96% (384)	96% (226)	96% (158)	96% (110)	98% (48)	.771	.756
Race	286						.581	.401
White		72% (205)	74% (120)	69% (85)	70% (61)	67% (24)		
Black or African American		9% (25)	7% (12)	11% (13)	13% (11)	6% (2)		
Other		20% (56)	19% (31)	20% (25)	17% (15)	28% (10)		
Education	400						.193	.023
High school diploma or less		56% (132)	56% (132)	49% (80)	55% (63)	35% (17)		
More than high school diploma		47% (188)	44% (105)	51% (83)	45% (51)	65% (32)		
Glasgow Coma Scale score	330	3; 8; 14	3; 9; 15	3; 7; 14	3; 7; 14	3; 7; 14	.105	.23
PTA duration, d	322	1.0; 22.0; 50.5	1.0; 19.0; 44.0	1.0; 28.0; 124.0	5.0; 25.0; 76.0	0.0; 32.5; 169.2	.016	.054
Time to follow commands, d	316	0.0; 4.0; 19.0	0.0; 2.0; 13.0	0.0; 9.0; 35.5	0.00; 6.00; 29.75	0.25; 14.00; 42.25	<.001	<.001
Cause of injury	399						.223	.204
Vehicular		50% (199)	53% (125)	45% (74)	49% (56)	38% (18)		
Fall		11% (44)	12% (29)	9% (15)	9% (10)	10% (5)		
Violence: penetrating		7% (29)	6% (14)	9% (15)	7% (8)	15% (7)		
Violence: blast		22% (88)	19% (45)	26% (43)	24% (28)	31% (15)		
Other		10% (39)	10% (23)	10% (16)	11% (13)	6% (3)		
Active duty	331	61% (202)	56% (107)	67% (95)	67% (66)	67% (29)	.041	.125
Injury during deployment	401	30% (121)	27% (63)	35% (58)	30% (35)	47% (23)	.06	.018
Mental health utilization prior	396						.065	.065
Yes		20% (79)	24% (56)	14% (23)	16% (18)	10% (5)		
No		13% (50)	12% (28)	14% (22)	11% (12)	21% (10)		
Not applicable		67% (267)	64% (151)	72% (116)	73% (83)	69% (33)		
Rehabilitation length of stay, d	400	22.8; 45.0; 83.2	23.0; 44.0; 70.0	21.0; 47.0; 117.5	20.0; 42.0; 115.8	35.0; 66.0; 119.0	.072	.039



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Rehospitalization in the First Year Following Veteran and Service Member TBI: A VA TBI Model Systems Study

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- First study of rehospitalization among a Veteran and Active Duty sample with TBI.
- Among 401 individuals readmitted with TBI, 164 (41%) were re-hospitalized by one year follow-up. This is higher than the civilian TBIMS study samples (i.e., 28%) despite being a younger cohort.
- **Of those rehospitalized:**
 - 70% of patients were rehospitalized once
 - 17% of patients were rehospitalized twice
 - 13% of patients were rehospitalized three or more times
 - Reasons for re-hospitalization differ than civilian TBIMS studies
- Individuals with at least one re-hospitalization had greater severity of TBI and (significantly longer PTA and coma duration) and were more likely to be active duty compared to those not re-hospitalized.
- Multiple re-hospitalizations were associated with deployment TBI and greater severity.
- Military factors associated with re-hospitalization.
- **Recognizing the frequency and types of re-hospitalizations in this population may allow for increased monitoring, education, and preventative care to reduce morbidity and long-term healthcare costs.**



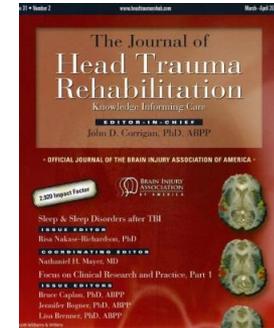
Caregiver and family focused

- **Stevens LF, Lapis Y, Tang X, Sander AM, Dreer LE, Hammond FM, Kreutzer J, O’Neil-Pirozzi TM, Nakase-Richardson R. Relationship stability after traumatic brain injury among veterans and service members: A VA TBI Model Systems study. *J Head Trauma Rehabil*, 2017; 32(4): 234-244.**
- **Bailey, EK, Nakase-Richardson R, Patel N, Dillahunt-Aspillaga C, Ropacki S, Sander AM, Stevens L, Tang X. Supervision needs following moderate to severe Veteran and Service Member Traumatic Brain Injury: A VA TBIMS Study. *J Head Trauma Rehabil*, 2017; 32(4): 245-254. doi: 10.1097/HTR.0000000000000317. PMID: 28520667.**
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Supervision Needs Following Veteran and Service Member Moderate to Severe Traumatic Brain Injury: A VA TBI Model Systems Study

Erin K. Bailey, PhD; Risa Nakase-Richardson, PhD; Nitin Patel, MPH;
Christina Dillahunt-Aspillaga, PhD; Susan A. Ropacki, PhD; Angelle M. Sander, PhD;
Lillian Stevens, PhD; Xinyu Tang, PhD

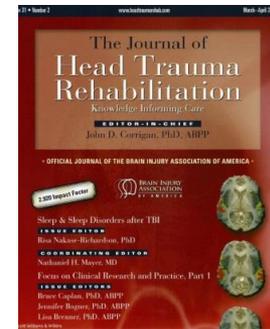


- What is supervision needs?
 - Monitoring for safety due to physical, cognitive, behavioral impairments
 - Optimally, it decreases over time as TBI sequelae improves
 - Measured by the Supervision Rating Scale in TBIMS
- Previously, no studies of incidence in the literature in Veteran TBI sample
- Civilian TBIMS samples report up to 30% requires supervision at 1 year with ongoing needs persisting at 5-years reported.
- Among 302 TBIMS Veterans and Service Members with moderate to severe TBI who had a 1-year follow-up, 107 (35%) still had supervision needs
- Greater injury severity, lower functional independence, and being married were predictors of supervision need in univariate models
- Injury severity (i.e., duration of PTA) only predicted supervision needs in multivariate modeling
- Resources and services needs should continue to be available for Veterans and Service members through one-year post-TBI in order to reduce the burden on caregivers.



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- What is supervision needs?
 - Monitoring for safety due to physical, cognitive, and behavioral impairments
 - Optimally, it decreases over time as TBI sequelae improves
 - Measured by the Supervision Rating Scale in TBIMS¹
- Civilian TBIMS samples report up to 30%² requires supervision at 1 year with higher percentages among DOC³ survivors. Ongoing needs persisting at 5-years post-injury³⁻⁴ have been reported.
- Previously, no studies of incidence in the literature in Veteran TBI sample
- Among 302 TBIMS Veterans and Service Members with moderate to severe TBI who had a 1-year follow-up, 107 (35%) still had supervision needs

1. Boake C. Supervision rating scale: a measure of functional outcome from brain injury. *Arch Phys Med Rehabil.* 1996; 77(8):765-772.
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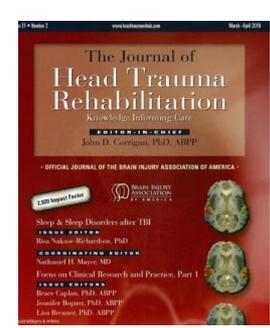


TABLE 2 Summary of supervision level by residence for the study sample^a

Supervision levels (SRS)	Private residence	Institutional setting	Hospitalization	Other	Subtotal by SRS
1. Independent: No supervision	147	2	2	4	155
2. Unsupervised at Night, sometimes during day	29	5	4	1	39
<i>Overnight supervision</i>					
3. Supervised only at night	4	2	0	0	6
<i>Part-time supervision</i>					
4. Supervised at night and selected day times	4	3	6	0	13
5. Supervised at night and part-time during day	7	2	1	0	10
6. Supervised at night and most of day except for few unsupervised hours	4	2	2	0	8
7. Only unsupervised for periods less than 1 hour at a time	3	0	1	0	4
<i>Full-time indirect supervision</i>					
8. Full-time indirect supervision	9	3	5	0	17
9. Same as # 8 but requires overnight safety precautions	4	1	1	0	6
<i>Full-time direct supervision</i>					
10. Full-time direct supervision	0	2	1	0	3
11. Full-time direct supervision in confined, controlled settings	2	9	2	0	13
12. Same as #11 but with constant visual watch	2	7	13	0	22
13. Person is in physical restraints	2	0	3	0	5
Subtotals by residence	215	38	41	5	

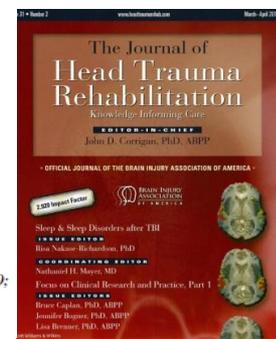
Abbreviation: SRS, Supervision Rating Scale.
^aSample size for this table was n = 299 due to missing residence for 3 cases.



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Relationship Stability After Traumatic Brain Injury Among Veterans and Service Members: A VA TBI Model Systems Study

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Therese M. O'Neil-Pirozzi, ScD, CCC-SLP; Risa Nakase-Richardson, PhD



- Relationship status was mostly stable up to 2 years post-injury:
 - 78% of those married at enrollment remained married at 2 year follow-up
 - 87% of those divorced/separated/single remained so at 2 year follow-up
- Predictors of negative change among married individuals:
 - Younger age at injury
 - Lower education at injury
 - Mental health utilization prior to injury
- Predictors of positive change among single/divorced/separated:
 - Injury during deployment
- Characteristics may serve as triggers for prioritizing relationship-focused counseling post-injury



Community Reintegration

- D'illahunt-Aspillaga C, Nakase-Richardson R, Hart T, Powell-Cope G, Dreer LE, Eapen BC, Barnett SD, Mellick DA, Haskin A, Silva MA. Predictors of employment outcomes in Veterans with traumatic brain injury: A VA TBI model system study. *J Head Trauma and Rehabil.* 2017; 32(4): 271-282.
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- McGarity S, Barnett S, Lamberty G, Kretzmer T, Powell-Cope G., Patel N., Nakase-Richardson R. A comparison of community reintegration problems among veterans and active duty service members with mild and moderate to severe traumatic brain injury. *J Head Trauma Rehabil.* 2016;32(1):34-45. doi: 10.1097/HTR.0000000000000242. PMID: 27323217



Implications for VA

- Re-hospitalization
 - How can post-discharge surveillance affect health status and healthcare utilization?
- Supervision Needs & Relationship Stability
 - What supports can VA provide to support caregivers in the home setting to maximize independence and quality of life?
- Community Reintegration
 - What can VA do to enhance vocational rehabilitation efforts?



Impact

- Development of a Veteran-specific database allows for determination of unique Veteran needs post TBI and benchmarks VA care against world class TBI rehabilitation facilities
- Veteran specific studies inform and guide VA policy
- The TBIMS critical research infrastructure promotes collaboration with other agencies and fosters application for additional grant funding
- VA TBI staff collaborate with TBIMS experts resulting in enhanced Veteran care and research



Contact Information

Informational Resources for TBMS	Website
VA TBI Model Systems Online Syllabus	va.tbindsc.org
NIDILRR TBI Model Systems	www.tbindsc.org
NIDILRR Model Systems Knowledge Translation Center (TBI, Burn, SCI)	www.msktc.org

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