



# Traumatic Brain Injury among the Homeless: Current State of the Science and Clinical Implications

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2012 National Health Care for the Homeless  
Conference & Policy Symposium



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# TBI 101



- Traumatic Brain Injury - A bolt or jolt to the head or a penetrating head injury that disrupts the function of the brain. Not all blows or jolts to the head result in a TBI. The severity of such an injury may range from “mild” (a brief change in mental status or consciousness) to “severe” (an extended period of unconsciousness or amnesia) after the injury.
- A TBI can result in short- or long-term problems with independent function.

# The Scope of the Problem



- 1.7 million injuries per year (approximately 200 per 100,000 persons per year)
  - Vast majority ~80%, are graded as mild, with 100% survival
  - ~10% are moderate, with 93% survival
  - ~10% are severe, with only 42% survival



# Bimodal Distribution and Highest Risk Age

Ages: 15 - 24

Ages: 65 - 75



Elderly adults – higher mortality rates

# TBI and Gender

- Traumatic brain injury is more than twice as likely in **males** than in females



# Alcohol/Drugs and TBI Acquisition



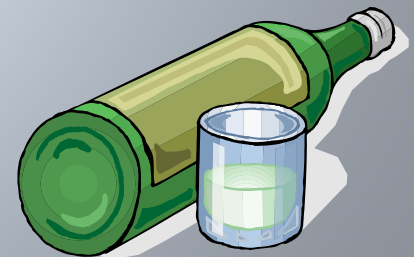
The greatest risk factors for traumatic brain injury:

Alcohol/drug use

An alcohol/drug disorder



Studies suggest that between 1/3 to slightly over 1/2 of persons with TBI are intoxicated at the time of injury and/or show a pre-injury history of alcohol abuse



# Risk Factors for Sustaining a TBI

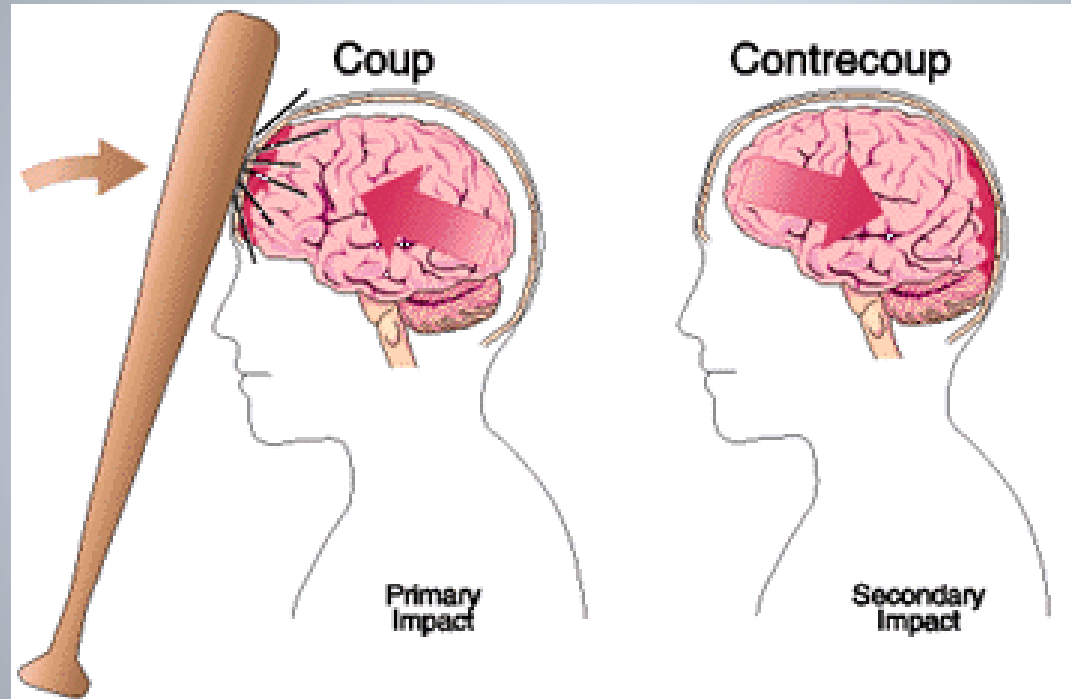
- Alcohol/drugs
- Familial discord
- Low SES
- Unemployment
- Low educational status
- Psychiatric symptoms
- Antisocial/Aggressive behavior
- Previous **TBI**

# Leading Causes of TBI

- Falls (28%)
- Motor Vehicle – Traffic Crashes (20%)
- Assaults (11%) Langolis et al. 2004
- Blasts are the leading cause of TBI for active duty military personnel in war zones DVBIC 2005



# Mechanism of Injury (Traditional)



Thanks John Kirk, Ph.D.

# Blast Injury

- Primary – Barotrauma
- Secondary – Objects being put into motion
- Tertiary – Individuals being put into motion





# Mild TBI Definition – American Congress of Rehabilitation Medicine

“Traumatically induced disruption of brain function that results in loss of consciousness of less than 30 minutes’ duration **or** in an alteration of consciousness manifested by an incomplete memory of the event **or** being dazed and confused.”

# Mild TBI

## Short- and Long-Term Effects

# Common Mild TBI/Postconcussive Symptoms

- Headache
- Poor concentration
- Memory difficulty
- Irritability
- Fatigue
- Depression
- Anxiety
- Dizziness
- Light sensitivity
- Sound sensitivity

Immediately post-injury 80% to 100% describe one or more symptoms

Most individuals return to baseline functioning within a year

7% to 33% have persistent  
symptoms

# TBI and Homelessness



# PubMed Search - 4/19/12

Substance abuse  
and homeless –  
**1,966** publications

Traumatic brain injury and  
homeless  
**12** publications

## Cognitive Function and Duration of Rooflessness in Entrants to a Hostel for Homeless Men

ALEXANDER J. BREMNER, PETER J. DUKE, HAZEL E. NELSON, CHRISTOS PANTELIS and THOMAS R. E. BARNES

**Background.** Four previous studies of homeless adults have yielded conflicting results regarding the presence of cognitive impairment.

**Method.** A consecutive series of 80 roofless entrants to a hostel for homeless men was sampled, and 62 (76%) completed a range of assessments, including measures of mental state, cognitive functions and substance use.

**Results.** Estimated premorbid IQ (mean=96), current IQ (mean=84) and cognitive speed were significantly lower than the norm. There was a significant IQ drop in all diagnostic groups. IQ drop, but not current IQ, correlated with duration of rooflessness. Those with schizophrenia or alcohol problems were roofless for longest. Alcohol misuse did not correlate with IQ drop, excepting alcohol withdrawal symptoms in those with schizophrenia.

**Conclusion.** The hypothesis that low IQ is a risk factor for rooflessness is supported. However, length of rooflessness was more closely related to IQ drop than to current IQ, suggesting that some third factor may be affecting both rooflessness and intellectual functioning. Roofless men with schizophrenia or alcohol problems may be especially at risk of long-term rooflessness.

### Neuropsychological Functioning of Homeless Men

Cindy Solliday-McRoy, PhD,\* Todd C. Campbell, PhD,\* Timothy P. Melchert, PhD, Terence J. Young, PsyD,\* and Ron A. Cisler, PhD†

**Abstract:** Numerous biological and psychological factors associated with impaired neurological functioning have been identified as common among the homeless, but there has been relatively little systematic examination of the cognitive functioning of homeless people. This study explored the neuropsychological functioning of 90 homeless men. There was great variability in their test scores, but the presence of possible cognitive impairment was detected in 80% of the sample. Average general intellectual functioning and reading abilities were found to be relatively low, and the incidence of impairments in reading, new verbal learning, memory, and attention and concentration was high. These findings suggest that the homeless men in this study had considerable assessment and treatment needs that were not being met by most of the health and social services offered to them.

**Key Words:** Assessment, homelessness, neuropsychological functioning.

(*J Nerv Ment Dis* 2004;192: 471-478)

The Journal of Nervous and Mental Disease  
Issue: Volume 189(3), March 2001, pp 176-181  
Copyright: © 2001 Lippincott Williams & Wilkins, Inc.  
Publication Type: [Articles]  
ISSN: 0022-3018  
Accession: 00009053-200103000-00006

[Articles]

Neuropsychological Evaluation of Higher Functioning Homeless Persons: A Comparison of an Abbreviated Test Battery to the Mini-Mental State Exam

GONZALEZ, EFRAIN A. Psy.D.<sup>1</sup>; DIETER, JOHN N. I. Ph.D.<sup>2</sup>; NATALE, RUBY A. M.S.<sup>1</sup>; TANNER, SUZAN L. Ph.D.<sup>1</sup>

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<sup>2</sup> Behavioral Perinatology Laboratory, Department of Psychology, Emory University, Atlanta, Georgia.

#### Abstract

This study examined neuropsychological functioning in a heterogeneous population of persons who were homeless (N = 60) and compared the value of the Abbreviated Halstead-Reitan Test Battery with the Mini-Mental State Exam (MMSE). A high incidence of neuropsychological dysfunction was evident with 80% of patients showing impaired test battery performance and 35% showing an impaired MMSE. Performance on the Trail Making Test, Part B was especially impaired. Patients impaired on Trails B more often showed impaired test battery performance, suggesting it may be a better screening tool than the MMSE. Neuropsychological performance was not significantly affected by the patients' gender, age, diagnosis, or past psychiatric and medical history. Regression analysis suggested that 25% of the variance in test battery performance was accounted for by the patients' education. Results support previous findings that large numbers of people who are homeless are neuropsychologically impaired; this should be considered when planning treatment and rehabilitation.

## Neurological deficits in the homeless: a downward spiral

Recent research has uncovered high rates of traumatic brain injury and cognitive dysfunction in the homeless. Might these problems contribute to their plight? Norra MacReady investigates.

For the *Milwaukee Society*  
see *Neurology* 2009; 73: 477-78

Homeless people have a high rate of traumatic brain injury (TBI), according to a study published in October, 2008. Stephen Hwang and colleagues at the University of Toronto surveyed 904 men and women at local shelters and meal programmes and found that 53% were likely to have a TBI over their lifetime, with 12% of cases having moderate or severe TBI. These findings were not surprising to Hwang, associate professor of medicine at the university, because "we had made the clinical observation that TBI was common among the homeless". However, what did surprise him was that, in 70% of cases, the first TBI occurred before the patient became homeless, a finding that "raises the hypothesis that the TBI might be a factor in the causal pathway to homelessness". In some cases, the injury occurred years in the past.

This study adds to a small but growing amount of published work documenting what those who work with the homeless already know: that cognitive and neurological impairments are common in this population. In fact, as Hwang suggests, the social and emotional problems, learning disabilities, memory lapses, and poor executive function that result from neurological injuries

might be what push people into homelessness, or at least make learning the skills needed to re-enter society all the harder. In a study of 90 men living in a homeless shelter in Milwaukee, WI, USA, 80% of the participants showed evidence of impaired cognitive function. The overall rate of TBI in the study

**"...the social and emotional problems, learning disabilities, memory lapses, and poor executive function that result from neurological injuries might be what push people into homelessness..."**

sample was 48%. In other studies, the occurrence of cognitive impairment has ranged from 28% to 78%.

Little is known about neurological impairment among the homeless, largely because many of the studies on the subject are small and many date back as far as the 1970s. In a survey of 100 homeless men, researchers at the Mount Sinai School of Medicine in New York, USA, found that 82% had a history of TBI due to a substantial blow to the head, often as the result of child abuse. Clinicians and caseworkers who work with the homeless can confirm the high rate of undiagnosed TBI.

Hwang decided to do the Toronto study because he could find no good published data to support his clinical impression that this population had high rates of TBI. "If we consider self-report and experience in the field, there is at least a subjective sense that the incidence of TBI among the chronically homeless is much higher than it is among the non-homeless population", says Virginia Luchetti, senior psychologist and

supervisor of the Mental Health Services Delivery System of the California Department of Corrections and Rehabilitation, Vacaville, CA, USA. Sometimes the injuries occur in unexpected ways. Luchetti recalls that, during her 5 years as director of the Homeless Encampment Outreach Project in California, many of the homeless people she and her colleagues saw used bicycles for transportation, often rode at night without helmets, and often had head injuries in accidents. Assaults were another common source of injury. "When I interviewed homeless clients and asked about head injury, the majority reported having received at least one serious TBI—being hit on the head with baseball bats and other objects, as well as automobile accidents."

Neuropsychiatrist Gregory O'Shanick, national medical director of the Brain Injury Association of America, says that TBI is seldom studied in the homeless because "it's not 'sexy'—there's no easy fix". The problem encompasses biological, psychological, and social factors, making it complicated to study. "People tend to stay away from it because it's messy", O'Shanick explains. Furthermore, assessment of the full effect of a brain injury can take years, so follow-up research is difficult, and funding is hard to obtain. The result, he says, is a paucity of information on the long-term outcomes of TBI, particularly among homeless people.

This is changing, however, as the fact that TBI is surprisingly widespread in the general population is becoming clear. According to the US Centers for Disease Control and Prevention, 1.4 million Americans have a TBI each year, and at

For more on the rates of TBI in homeless people see *BMJ* 2008; 337: 779-84

The printed journal includes an image merely for illustration

Photo: iStockphoto.com/John H. Johnson

www.thelancet.com/neurology Vol 8 March 2009

Recent research has uncovered high rates of traumatic brain injury and cognitive dysfunction in the homeless. Might these problems contribute to their plight? Norra MacReady investigates.

## Traumatic Brain Injury and Homelessness: A Review

Jane Topolovec-Vranic, Naomi Ennis

St. Michael's Hospital, Toronto, Canada

**Table 1: Published Research Studies**

Research Study	Setting	Population (Sample size; n males; age (SD); duration homelessness in days(SD))	How was TBI Measured	Prevalence of TBI among homeless sample
Hwang et al., (2008).	Toronto Shelters and Meal Programs	904; 601 males; 37.4(12.9); 1606 days (2153.5)	Self- Report: "Have you ever had an injury to the head which knocked you out or at least left you dazed, confused or disoriented?"	53%
Solliday- McRoy et al. (2004)	Large Homeless shelter in Milwaukee, Wisconsin (USA)	90; 90 males; 40.96 (NR); 87.68 days (NR)	Self-Report	47%
Cotman & Sandman (1997)	Homeless residents of an 18 month residential program (Orange County, California)	24; 13 males; 30.6 (6.5); Mean days homeless NR	Self-report	8.3%
Hux et al. (2009)	Separate samples from a homeless shelter, vocational rehabilitation centre, mental health facility & domestic abuse facility (Midwest, USA)	<i>N</i> = 1999 all sites, (Homeless shelter <i>n</i> = 240); 33 males; 35.56 (NR); Mean days homeless NR	HELPS screening Tool	20%
Bremner et al. (1996)	Hostel in London, England	62; 62 men; age NR; duration of homelessness NR	Detailed semi-structured questionnaire to assess health history	46%
Gonzalez et al. (2001)	Health Care for the Homeless Clinic in Miami, Florida	60; 36 males; 39.8 (11.4); duration of homelessness NR	Documented instance of concussion or loss of consciousness or the patient's self-report	38.3%

## The effect of traumatic brain injury on the health of homeless people

Stephen W. Hwang MD MPH, Angela Colantonio PhD OT Reg, Shirley Chiu MA, George Tolomiczenko PhD MPH, Alex Kiss PhD, Laura Cowan BScN, Donald A. Redelmeier MD MSHSR, Wendy Levinson MD

CMAJ 2008;179(8):779-84

- 53% for any TBI
  - 12% for moderate to severe TBI



## The effect of traumatic brain injury on the health of homeless people

Stephen W. Hwang MD MPH, Angela Colantonio PhD OT Reg, Shirley Chiu MA, George Tolomiczenko PhD MPH, Alex Kiss PhD, Laura Cowan BScN, Donald A. Redelmeier MD MSHSR, Wendy Levinson MD

CMAJ 2008;179(8):779-84

- Increased likelihood of
  - Seizures
  - Mental health problems
  - Drug problems
- Poorer
  - Physical health
  - Mental health status



# Characteristics of 904 Homeless Individuals

Characteristic	Total no. (%)* of participants n = 904	Traumatic brain injury; no. (%) of participants*		p value
		Present n = 475	Absent n = 429	
Age at first episode of homelessness, yr, mean (SD)	28.5 (13.8)	27.5 (13.3)	29.6 (14.2)	0.02
Lifetime years of homelessness, mean (SD)	4.4 (5.9)	4.9 (6.3)	3.8 (5.4)	0.006
Seizures (ever experienced in lifetime)	139 (15)	103 (22)	36 (8)	< 0.001
Mental health problems in the last 30 days	344 (38)	204 (43)	140 (33)	0.001
Alcohol problems in the last 30 days	322 (36)	201 (42)	121 (28)	< 0.001
Drug problems in the last 30 days	442 (49)	269 (57)	173 (40)	< 0.001
Mental component subscale score‡, mean (SD)	41.3 (13.2)	39.0 (12.7)	43.8 (13.2)	< 0.001
Physical component subscale score‡, mean (SD)	45.9 (11.1)	43.9 (11.4)	48.1 (10.3)	< 0.001

Note: SD = standard deviation.

\*Unless otherwise indicated.

†Ethnic background was self-identified by participants.

‡Measured using the SF-12 health survey.

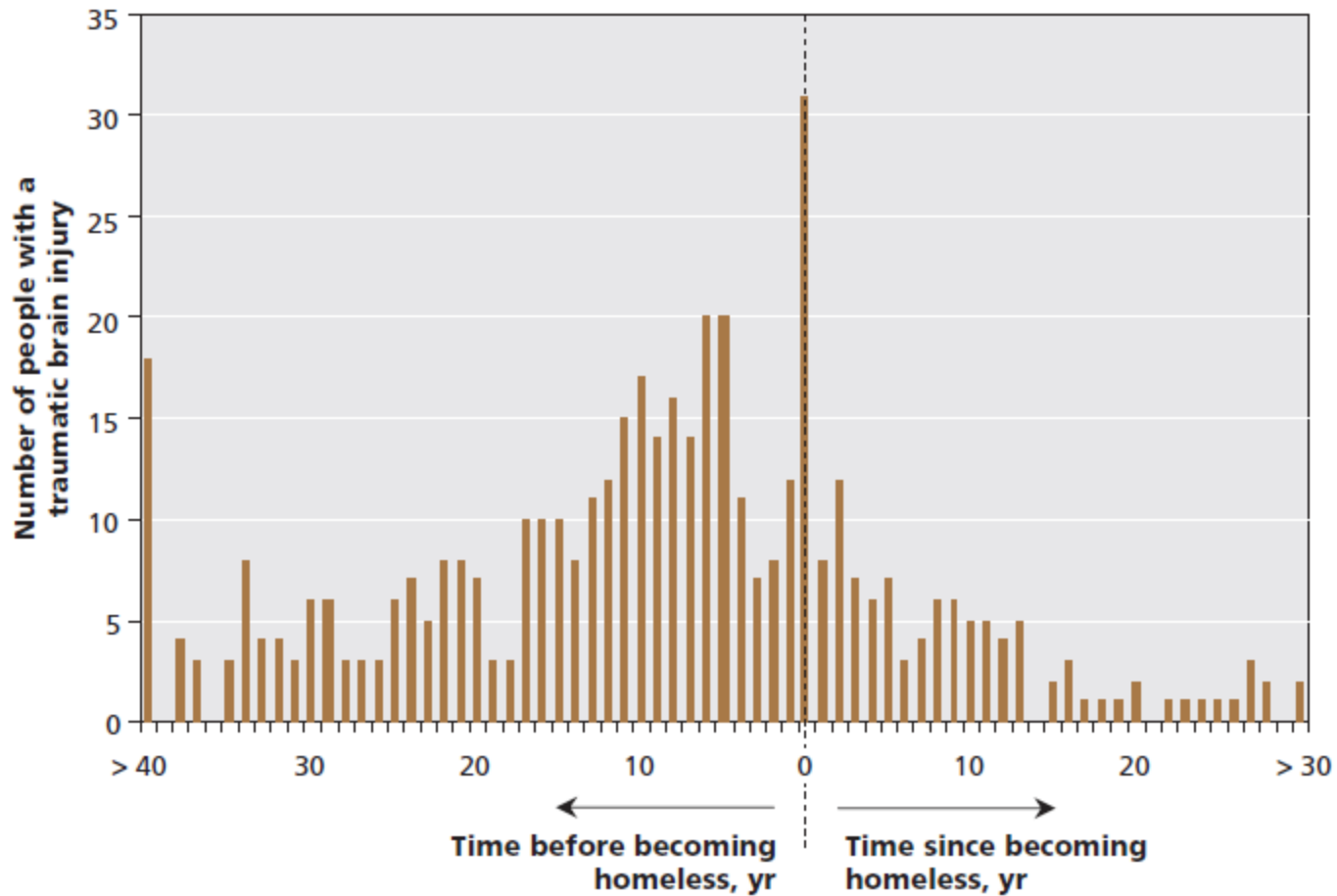


Figure 2: Homeless participants ( $n = 461$ ) who experienced a traumatic brain injury before or after becoming homeless.

For 70% of respondents – 1<sup>st</sup> TBI occurred prior to onset of homelessness

# Risk Factors for TBI in a Homeless Population

- Homeless at an increased risk for injury including head injury, secondary to falls  
(Morbidity and Mortality Weekly Report, 1991)
- Increased risk of being the victim of violent assaults (Geissler, et al., 1995)
- Elevated rates of substance abuse (Koegel et al., 1988)
  - 58% - 68% -- 6 to 7 times the general population  
(Fischer and Breakey, 1991)

## *Homelessness and Risk Factors For Acquiring TBI*

- Increased risk for injury & trauma
- Elevated substance abuse

## *TBI and Risk Factors for Becoming Homeless*

- Decreased Income
- Decreased Social Support

***Brain Injury***



***Homelessness***



Do Veterans seeking mental health services really have a history of TBI?

# TBI in a MH Setting TBI – 4 (n=1,810)

Question	Q1. Veteran has been treated in an emergency room following an injury	Q2. Veteran has been knocked out or unconscious following an accident or injury	Q3. Veteran has injured head or neck in a car accident or from some other moving vehicle accident	Q4. Veteran has injured head or neck in a fight or fall
# Yes	741	813	632	728
% Yes	41%	45%	35%	40%

Any Question (n=1,810, 63%)

Why else might I need to know that  
the Veteran I am working with has a  
history of TBI?

# Suicide and Traumatic Brain Injury Among Individuals Seeking Veterans Health Administration Services

Lisa A. Brenner, PhD, ABPP; Rosalinda V. Ignacio, MS; Frederic C. Blow, PhD

**Objective:** To examine associations between history of traumatic brain injury (TBI) diagnosis and death by suicide among individuals receiving care within the Veterans Health Administration (VHA). **Method:** Individuals who received care between fiscal years 2001 to 2006 were included in analysis. Cox proportional hazards survival models for time to suicide, with time-dependent covariates, were utilized. Covariate sandwich estimators were used to adjust for the clustered nature of the data, with patients nested within VHA facilities. Analyses included all patients with a history of TBI ( $n = 49,626$ ) plus a 5% random sample of patients without TBI ( $n = 389,053$ ). Of those with a history of TBI, 103 died by suicide. Models were adjusted for demographic and psychiatric covariates. **Results:** Veterans with a history of TBI were 1.35 (95% confidence interval [CI], 1.24-1.52) times more likely to die by suicide than those without a history of TBI. Analyses by TBI severity were also conducted, and they suggested that in comparison to those without an injury history, those with (1) concussion/cranial fracture were 1.98 times more likely (95% CI, 1.39-2.87) to die by suicide and (2) cerebral contusion/traumatic intracranial hemorrhage were 1.34 times more likely (95% CI, 1.09-1.64) to die by suicide. This increased risk was not explained by the presence of psychiatric disorders or demographic factors. **Conclusions:** Among VHA users, those with a diagnosis of TBI were at greater risk for suicide than those without this diagnosis. Further research is indicated to identify evidence-based means of assessment and treatment for those with TBI and suicidal behavior. **Keywords:** suicide, traumatic brain injury, veterans

AMONG MEMBERS of the general population, individuals with a history of traumatic brain injury (TBI) are at increased risk for suicidal behavior as compared with those without an injury history.<sup>1</sup> Silver and colleagues<sup>2</sup> found that those with a TBI reported a higher frequency of suicide attempts, 8.1% versus 1.9%

in the general population. In a seminal study, Teasdale and Engberg<sup>3</sup> reviewed hospital admission records and found that the incidence of suicide among those with concussion, cranial fracture, and cerebral contusion/intracranial hemorrhage were increased relative to the population on whole.

These findings are particularly relevant in light of the high rate of TBI being sustained by military personnel serving in Iraq and Afghanistan,<sup>4,5</sup> and concerns regarding suicidal behavior among members of the armed forces and veterans.<sup>3,6</sup> Estimates of military personnel serving in current conflicts who have either screened positive or been diagnosed with clinician-confirmed mild TBI range from 11% to 23%.<sup>3,6,7,8</sup> In addition, recent studies suggest a high rate of TBI among individuals seeking Veterans Health Administration (VHA) mental health and substance abuse treatment services.<sup>3,9</sup>

According to a recently published report by the Department of Defense Task Force on the Prevention of Suicide by Members of the Armed Forces,<sup>5</sup> between 2005 and 2009, more than 1100 individuals in the military died by suicide. These numbers reflect a sharp increase in the rate of suicide among marines and soldiers, with the rate of suicide among army personnel more than doubling.<sup>5</sup> Moreover, in comparison with members of the general population, suicide rates among

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*Preliminary data regarding traumatic brain injury (TBI), all combined, and suicide were presented at the International Brain Injury Association's Eighth World Congress on Brain Injury. An abstract of the presentation will appear in the journal Brain Injury. This abstract is approximately 400 words. A full manuscript with complete information is available at <http://dx.doi.org/10.1097/HTR.0b013e3182222222>. The data regarding TBI by severity have not been previously presented.*

*Dr. Brenner and Blow and Ms. Ignacio report no competing interests. The authors thank Drs. Joe Koenig, Joe Kemp, and John M. Carthy for their assistance in obtaining and analyzing data presented in this manuscript.*

*The project was supported by the VSN (MIRECC), VA SMITRECC, and the VA Office of Mental Health Services.*

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*DOI: 10.1097/HTR.0b013e3182222222*

Individuals who received care between FY 01 and 06

Analyses included all patients with a history of TBI ( $n = 49,626$ ) plus a 5% random sample of patients without TBI ( $n = 389,053$ )

Suicide - National Death Index (NDI) compiles death record data for all US residents from state vital statistics offices

TBI diagnoses of interest were similar to those used by Teasdale and Engberg

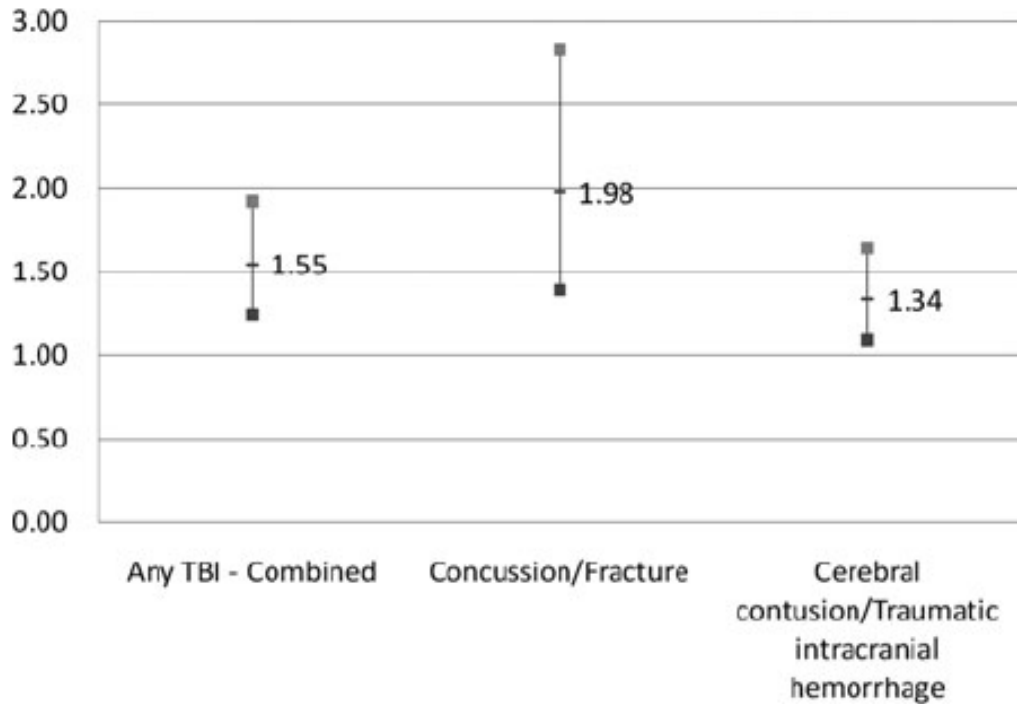
# Suicide by TBI Severity – VHA Users FY 01-06

- 12,159 with concussion or cranial fracture, of which 33 died by suicide
- 39,545 with cerebral contusion/traumatic intracranial hemorrhage of which 78 died by suicide
- Of those with a history of TBI, 105 died by suicide

Challenges associated with this type of research  
and need for collaboration  
(~8 million records reviewed)







**Figure 2.** Hazard ratios for suicide by traumatic brain injury severity adjusted for sex, age, and psychiatric conditions.

*ICD-9 codes:*  
 1) concussion (850), cranial fracture—fracture of vault of skull (800), fracture of base of skull (801), and other and unqualified skull fractures (803)  
 (2) cerebral laceration and contusion (851); subarachnoid, subdural, and extradural hemorrhage after injury (852); other and unspecified intracranial hemorrhage after injury (853); and intracranial injury of other and unspecified nature (854).



Cox proportional hazards survival models for time to suicide, with time-dependent covariates, were utilized.

Covariance sandwich estimators were used to adjust for the clustered nature of the data, with patients nested within VHA facilities.



Diagnosis	All		Those who died by suicide		Those who did not die by suicide		P
	N	Col%	N	Col%	N	Col%	
VHA users with any TBI (combined)							
All	49 626	100	105	100	49 521	100	
Substance abuse	8368	16.86	32	30.48	8336	16.83	.0002
Bipolar I/II	2265	4.56	10	9.52	2255	4.55	.0292
MDD	4,464	9	24	22.86	4440	8.97	<.0001
Other depression, no MDD	7616	15.35	23	21.9	7593	15.33	.062
Other anxiety	4326	8.72	16	15.24	4310	8.7	.0177
PTSD	4880	9.83	23	21.9	4857	9.81	<.0001
Schizophrenia/schizoaffective disorder	2287	4.61	6	5.71	2281	4.61	.4875
VHA users with concussion/fracture							
All	12 159	100	33	100	12 126	100	
Substance abuse	2087	17.16	9	27.27	2078	17.14	.123
Bipolar I/II	588	4.84	2	6.06	586	4.83	.6731
MDD	1198	9.85	10	30.3	1188	9.8	.00092
Other depression, no MDD	1831	15.06	7	21.21	1824	15.04	.3271
Other anxiety	1148	9.44	7	21.21	1141	9.41	.0316
PTSD	1376	11.32	7	21.21	1369	11.29	.0912
Schizophrenia/schizoaffective disorder	519	4.27	1	3.03	518	4.27	.9999
VHA users with cerebral contusion/traumatic intracranial hemorrhage							
All	39 545	100	78	100	39 467	100	
Substance abuse	6728	17.01	25	32.05	6703	16.98	.0004
Bipolar I/II	1802	4.56	8	10.26	1794	4.55	.0256
MDD	3490	8.83	17	21.79	3473	8.8	<.0001
Other depression, no MDD	6142	15.53	17	21.79	6125	15.52	.1263
Other anxiety	3377	8.54	11	14.1	3366	8.53	.0785
PTSD	3757	9.5	17	21.79	3740	9.48	.0002
Schizophrenia/schizoaffective disorder	1869	4.73	5	6.41	1864	4.72	.4199

Veterans are disproportionately represented in the homeless population

Homeless veterans report histories of mental health complaints

Veterans seeking mental health services are reporting high rates of TBI and this history appears to be related to negative psychiatric outcomes

# Homelessness among Veterans

- U.S. population in 2009 consisted of nearly 23 million Veterans
- On a single night in January 2009 75,609 Veterans were homeless (~ 33 for every 10,000)
- Between October 1, 2008 and September 30, 2009 136,334 Veterans spent at least one night homeless (~ 60 out of every 10,000)

# Homelessness among Veterans

- In 1996, the National Survey of Homeless Assistance providers and Clients estimated that 23% of the homeless population were Veterans
- VA facilities have reported an increase of 24% in homeless Veteran families seeking care
- The percentage of homeless female Veterans is expected to increase dramatically as the female Veteran population has increased in recent years

# Psychiatric illness, substance abuse, and chronic medical illness among homeless veterans?

- 2009 Veteran AHAR estimates ~ 53% of homeless Veterans have some kind of disability
- Homeless shelters in Santa Clara County, CA (1989-1990) found that of Veterans admitted 17% were for psychiatric problems, 29% alcohol abuse, & 22% illegal drug use
- Of homeless adults in Pittsburgh & Philadelphia, 61.4% reported psychiatric problems, 79.5% substance abuse, and 66.1% at least one chronic medical condition



# Risk and Protective Factors

- Some risk factors consistent across Veteran & non-Veterans are inadequate care by parents, foster care or group placement, prolonged periods of running away from home, low or unstable income, low social support, & history of incarceration
- Differ in terms of protective factors: homeless Veterans tend to be older & better educated, have had better early family cohesion, & more likely to have been married
- Veterans may possess unique experiences associated with post-deployment readjustment



# Factors specific to military service?

- Prolonged or intense combat exposure negatively impacts mental health, employment, income & social support, thus indirectly increasing the risk of homelessness among Veterans
- The frequency and disruptive nature of readjustment/post-deployment periods increase risk factors such as alcohol use, substance use and/or low social support and the likelihood of negative outcomes for both substance use and social support
- In a small study, MST has been associated with increased risk among female Veterans

# TBI Among Homeless Veterans

## Three Sites

- Denver VAMC (data collection)
  - Lisa Brenner, Ph.D. (PI)
  - Kim Arne, MSW
  - Maria Devore, MS
  - Leah Russell, MA
- Philadelphia VAMC (IRB Approval)
  - Vince Kane, LCSW
  - Ann Elizabeth Montgomery, Ph.D.
- Tampa VAMC (IRB Approval)
  - Roger Casey, Ph.D. (PI)
  - John Schinka, Ph.D.

# Study Methods

- All Veterans seeking VA homeless services
- Ages 18 to 89
- Participation includes completing several measures administered by Research Team Member
- 1 to 2 visits – \$20 compensation

# TBI-4 Questions

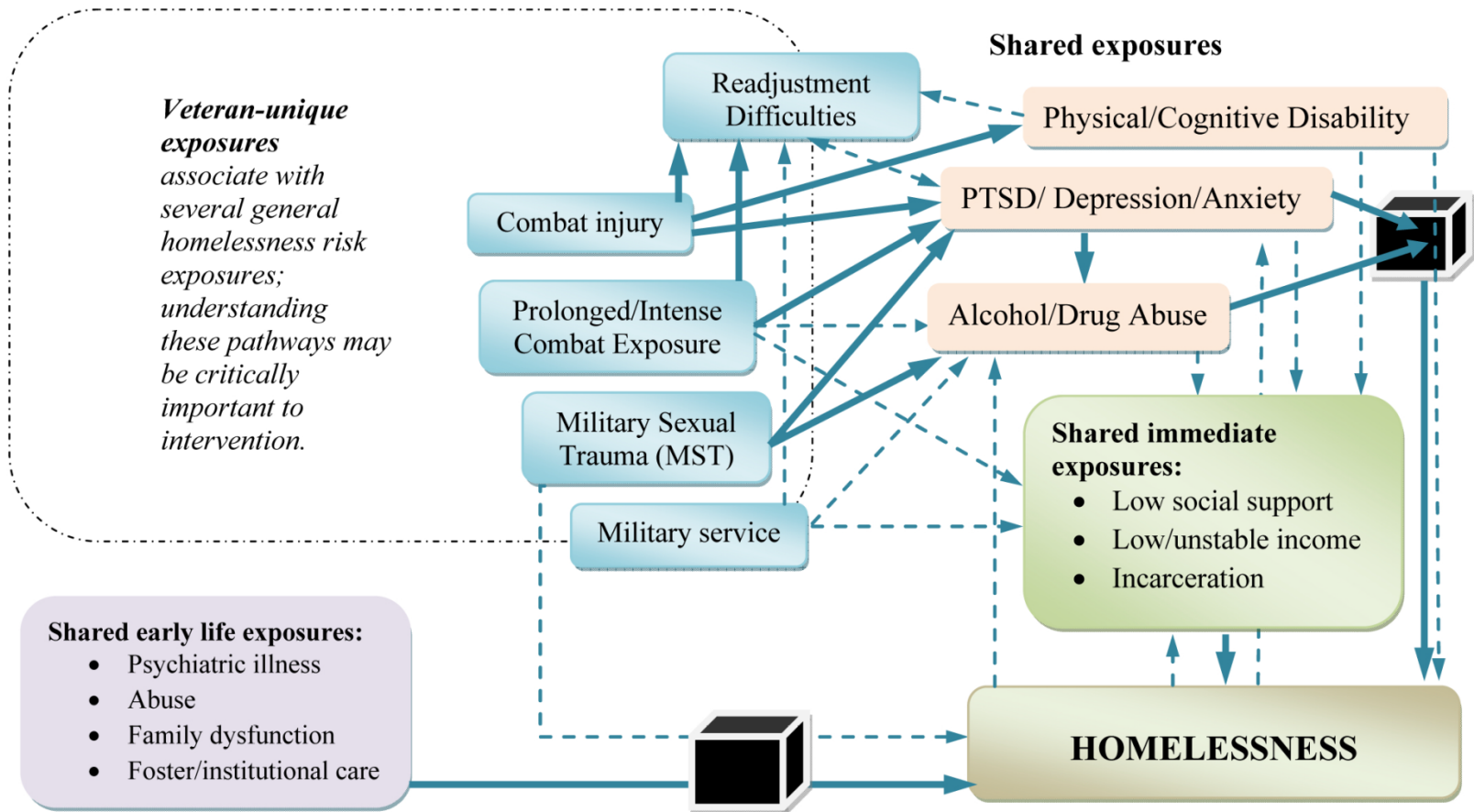
- 1) Have you ever been hospitalized or treated in an emergency room following a head or neck injury?
- 2) Have you ever been knocked out or unconscious following an accident or injury?
- 3) Have you ever injured your head or neck in a car accident or from some other moving vehicle accident?
- 4) Have you ever injured your head or neck in a fight or a fall?

# Measures - Data

- MINI International Neuropsychiatric Interview
- Ohio State University TBI Identification Method
- Demographic Questionnaire
- VA Medical Records



# Risk Factors for Veteran Homelessness: Conceptual Model



Time →  
 Pre-Service                      Military Service                      Post-Deployment                      Long Term Post-Service

→ (solid arrow) = strong association shown by two or more studies reviewed      = unknown exposure/mechanism  
 - - - (dashed arrow) = weak association only shown by one study reviewed, or evidence is mixed



# Next Steps - Homelessness + TBI

- Complete data collection – 3 sites
- Explore outcomes
  - Increased likelihood of
    - Seizures
    - Mental health problems
    - Drug problems
  - Poorer
    - Physical health
    - Mental health status



# Use Your Smartphone to Visit the VISN 19 MIRECC Website

## Requirements:

1. Smartphone with a camera
2. QR scanning software (available for free download just look at your phone's marketplace)

[www.mirecc.va.gov/visn19](http://www.mirecc.va.gov/visn19)

